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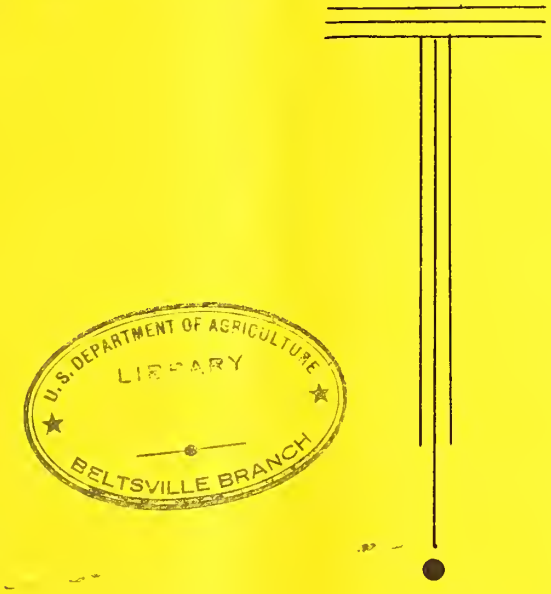
METHODS OF HANDLING AND DELIVERING ORDERS USED BY SOME LEADING WHOLESALE GROCERS



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PRODUCTION AND MARKETING ADMINISTRATION
in cooperation with
UNITED STATES WHOLESALE GROCERS' ASSOCIATION

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Marketing Research Report No. 13

PREFACE

This is the first of a number of reports to be issued under a research project covering wholesaler-retailer relations. The objective of the project is to find ways to hold down the costs of distributing food through this part of the marketing channel.

Preparation of this report was made possible through the cooperation and assistance of many individuals and organizations in the wholesale grocery industry, as well as officials of the U. S. Department of Agriculture.

Special credit is due C. S. Ragland, President of C. B. Ragland Company and member of the Merchandising Advisory Committee, for advice in planning the over-all study, and to Harold Smith, Executive Secretary of the U. S. Wholesale Grocers' Association, for assistance in the general conduct of the research and particularly for his assistance in working with the trade.

Special credit also is accorded John Bromell, Operations Consultant to the U. S. Wholesale Grocers' Association, for his comments on the findings of the survey and for his criticism of the manuscript.

R. W. Hoecker, Staff Assistant for Distributive Research, Marketing and Facilities Research Branch, gave general supervision to the study and E. D. Downie, formerly with this Branch, collected the case material on which much of this report is based.

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The study on which this report is based was made under authority of the Agricultural Marketing Act of 1946 (RMA, Title II).

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SUMMARY

Two factors have challenged traditional methods of food distribution in this country in the past few years—the advent of large-scale distributors in the food retailing market and the recent phenomenal growth of "super markets." Progressive independent retailers and the grocery wholesalers who serve them have been joining forces to meet this challenge and to find ways of operating more efficiently and effectively. Initial surveys of wholesaler-retailer relations have revealed ways in which many grocery wholesalers are increasing the efficiency of their own operations and making those of the retailers more effective. This report describes methods employed by some of the leading wholesale grocers to improve the efficiency and hold down the costs of operations connected with handling and delivering orders. No attempt has been made to determine which practices are the best or whether they can be improved.

Among the ways in which wholesalers are attempting to reduce the costs of taking sales orders, those that appear particularly promising are as follows:

1. Reducing the amount of work done by salesmen in taking orders, thereby lowering the cost of selling as a percentage of the dollar volume of sales. The principal device used to accomplish this is the "pre-printed"order form on which the retailer can make up his order and either mail it in or have it ready when the salesman calls.

2. Increasing the size of orders at each call. Although most wholesalers have been paying their salesmen in part, or entirely, on the basis of volume and profitableness of the business obtained, some wholesalers have been emphasizing retailer discounts for volume purchases as a means of increasing the size of orders. These discounts usually vary with the volume of business placed weekly or monthly and are a means of passing on to the retailer savings in operating costs made possible by his placement of larger orders. Other wholesalers have devoted their efforts to building better, more loyal customers and in return have obtained the larger orders made feasible for the retailers by the growth of their business operations and altered buying practices.

3. Eliminating calls for unprofitable orders. Wholesalers have attacked the problem of unprofitable orders on two fronts: (1) They have introduced customer selection programs to avoid making calls on retailers whose orders are consistently unprofitable; and (2) they have established minimum orders to discourage salesmen and retailers from placing orders that are too small to be handled at a profit.

Methods of cutting costs of paper work have not been systematically studied by grocery wholesalers. Although some wholesalers who have introduced mechanical accounting systems have reported savings in clerical costs, examination of the typical operation suggests that economies could also be effected by other procedures.

Grocery wholesalers have given considerable attention to warehousing and to methods of assembling orders efficiently. Stock arrangements that do most to facilitate order assembling are: (1) Arranging merchandise in a systematic fashion so that order men will know where each item is and thus avoid needless searching and back tracking; (2) separating reserve stocks and selection lines from which items are to be picked, and arranging items that have fast turn-over and those which are heavy and bulky in such a way as to minimize the ton-distances covered by order men in the course of filling a day's orders; (3) handling special order requirements such as less-than-case lots, small items, and small orders by procedures especially devised to minimize the expense involved in filling them, as well as their interference with the regular order routine.

Some wholesalers have devised better physical arrangements in the warehouse, and have developed procedures that help to obtain optimum utilization of the warehouse force and equipment. Especially noteworthy are the following:

1. Integrating operations; that is, organizing the work so that each part of the job is timed to make most efficient use of plant and personnel. This practice helps to reduce standby time, frees equipment used in one operation in time for its use in a subsequent operation, and thereby reduces the amount of equipment needed to handle a given volume.

2. Balanced handling; that is, getting a balance between members of a crew or work team and the equipment they use so that all individuals and all equipment are fully utilized and are making a maximum contribution to the job.

A number of grocery wholesalers have been especially successful in reducing delivery costs. To cut direct costs of delivery, wholesalers have worked closely with their retailers to reduce the number of deliveries and to reduce the time spent in truck unloading. The number of deliveries is being reduced by helping customers to avoid needing special orders and by weeding out the few who persisted in requests for unwarranted extra deliveries. Time spent in unloading has been pared by getting retailer cooperation in moving the goods from truck to stockroom and by mutual agreement regarding delivery receipts.

Efforts to have retailers pick up more merchandise have centered around cash-and-carry arrangements. These have included the practice of referring late orders to cash-and-carry, offers of discounts on cash-and-carry purchases, and installation of special facilities and procedures

for processing cash-and-carry orders. Some savings in direct delivery costs have also been accomplished by improving truck routing and by utilizing common carriers where their charge is less than the cost of operating a truck. The utilization of common carriers is particularly applicable where the truck would be loaded to only a fraction of its capacity on a delivery far distant from the warehouse.

Wholesalers' efforts to minimize costs have included reductions in delivery overhead and in direct delivery expenses. Basic to such endeavors have been preventive maintenance programs designed to lower charges for maintenance and depreciation, by reducing the number of accidents, and by reducing the number of breakdowns arising from faulty equipment, and, in some instances, reducing the number of standby trucks. In some cases, the need for standby trucks has been virtually eliminated by leasing additional trucks as needed or by a general leasing arrangement which covers all truck requirements. Driver selection and training programs have also resulted in lower maintenance costs and fewer accidents. Delivery overhead has been lightened further by utilizing delivery trucks more nearly to capacity. Better use of truck equipment is often obtained not only by loading trucks as nearly full as possible but also by arranging for return hauls and, where feasible, integrating deliveries to branch warehouses with regular customer deliveries.

The desire to exercise effective control over the delivery operation has led grocery wholesalers to use driver logs and mechanical recorders of truck movements to determine how effectively the driver uses his time. Research workers, with the help of several wholesalers developed a procedure by which management can more accurately measure the productivity of the driver; that is, his industry and efficiency. This procedure also permits the establishment of standards of performance for drivers and makes it possible to compare the over-all efficiency of delivery operations between different periods of time and perhaps, different companies.

The type of wholesaler activities described in this brief report indicate: (1) That the cost of many wholesaling operations can be reduced; and (2) that only a beginning has been made in finding ways of doing these jobs more efficiently. Research might profitably be conducted on: Procedures to facilitate direct placement of orders by the retailer; incentives by which salesmen and retailers may be encouraged to increase the size of their orders; methods of doing the paper work connected with processing orders; and means of assembling orders, loading trucks and unloading at retail stores. In cooperation with the industry, further progress is expected in determining ways of doing many of these operations at less cost. Thus the private marketing system would do an even better job of moving food products from the farmer to the consumer.

METHODS OF HANDLING AND DELIVERING ORDERS USED BY SOME LEADING WHOLESALE GROCERS

By Martin Kriesberg, marketing specialist,
Marketing and Facilities Research Branch
Production and Marketing Administration

INTRODUCTION

During recent years there have been many changes in methods of food distribution. Not the least of these changes has been the increased collaboration between independent retailers and wholesale grocers in an effort to meet the competition of growing large-scale food distributors. The responsibility for devising more economical methods of distributing foods through independent retailers rests in large part on the wholesalers who serve the retailers. Because of their position in the distribution system and their familiarity with the operations of thousands of retailers, wholesale grocers are in a position to take the leadership in effecting efficiencies in the marketing of food products.

Leaders in the industry are agreed that there is urgent need for better teamwork between wholesalers and retailers. They believe that efficiency in wholesaling operations is one of the most important factors in building and maintaining such teamwork. Accordingly, a study was undertaken to ascertain some of the more efficient operating practices and some of the more effective ways in which wholesalers are working with retailers in order to hold down the costs of marketing.

Since grocery wholesalers occupy an important place in the marketing of farm products, anything the wholesalers can do to help place products before consumers in such a way or at such a price that will influence them to buy more products not only will mean better business for wholesalers but will give the farmer a larger outlet for his product and will also benefit the consumer.

The survey on which this report is based was primarily concerned with observing the more efficient practices in delivering from wholesaler to retail store. However, since many of the costs and problems of delivery originate at the time the order is taken or assembled, these aspects of wholesaling also were observed. It should be noted that this was an initial survey in determining methods to bring about greater operating efficiency in grocery wholesaling, and as such it attempts merely to record methods currently in use by some leading wholesalers. The detailed analysis necessary to improve these methods was not undertaken

The cost of taking orders and assembling and delivering them is a significant part of the relatively small margin on which the wholesale grocer works. Therefore, a saving of even a small percentage in the proportion of expenses for these operations can mean a gain in net profit. Retailers, too, have a stake in lowering the cost of these wholesaling operations, since wholesaling costs may be passed on to the retailer and ultimately to the consumer. If these costs are too high, consumer resistance to buying will be encountered, and a net decrease in purchases from the independent retail grocer will follow.

In an attempt to observe the most efficient practices now being used by wholesalers, case studies were made of wholesale grocers who, according to persons in the trade, operate efficiently. Considerable time was spent with each wholesaler. Management, salesmen, order men, truck drivers, and office help were interviewed. Each operation was observed at different times of the day and on different days of the week. In most instances, the methods described here were observed at the establishments of one or more of the firms whose operations were studied.

The practices being followed by these leading wholesalers are being made known so that they may be adopted by other wholesalers and the efficiency of the wholesale trade thereby generally raised. However, to learn whether these are the best practices in doing the particular task or whether they could be improved, a more intensive study involving, perhaps, time studies and controlled tests would be necessary.

Factors such as available personnel, personnel turn-over, competitive trade practices in an area, and the historical development of a company will affect the feasibility of introducing some of the practices reported here. For example, a company without a formal inventory control system may show a low ratio of "outs" and a high ratio of stock turns simply because the experienced person in charge has an uncanny knowledge of the stock situation at all times. To install an involved inventory control system before this person dies or retires would probably be an unnecessary expense. Similarly, a company doing a large proportion of its business on a cash-and-carry basis and operating only two or three trucks has little need for a comprehensive system of driver supervision. It is assumed that the individual wholesaler will take into account the special conditions under which he operates in deciding which of the practices might merit his consideration.

The wholesalers studied are located east of the Mississippi River. Individually they do a gross business of from 2.5 to 18 million dollars annually--virtually all of this business being in groceries. The major part of their sales are to independent retail grocers, although some of the wholesalers have developed a fair amount of business with institutions. The wholesalers were selected so as to include some having agreements with a group of retailers (often called voluntary chains), some with close working relations with their retailers but without formal

ties, and some who do not do business with a voluntary chain nor have particularly close relations with retailers. These particular wholesalers were selected so that it would be possible in making the study to observe the various types of wholesaler-retailer relationships.

This report covers two broad fields: (1) Efficient methods of handling sales orders (including the taking of orders, the handling of paper work in sales order processing, and methods of order selecting and assembling); and (2) ways of holding down the costs of delivery (including both the direct and overhead costs of the delivery operation).

MORE EFFICIENT WAYS OF HANDLING SALES ORDERS

Many tasks are performed in handling an order, from the time the order is written up until the goods are loaded on delivery trucks. In this report only the high points of the various operations are discussed. Attention is called to some of the more promising practices that wholesalers are following to make their order taking, paper work routine, and order assembling as efficient as they know how. Although certain ideas may appear elementary to one wholesaler, they may be new to another one. Thus all can profit by sharing these experiences.

Some Efficient Ways of Taking Sales Orders

Most wholesale grocery salesmen perform a threefold job: They write up orders given by the retailer; they open new accounts and sell additional merchandise to regular customers; and sometimes they assist retailers in merchandising. It is important to recognize these different tasks because selling and merchandising skills are far more expensive to hire than those of order taking. If a salesman is being paid to sell but spends most of his time writing up orders, the wholesaler is not getting the best use of his personnel or his money. Retailers may place their orders without personal visits. Several of the wholesalers who have voluntary chain affiliates get the bulk of their orders by mail and merely have a small group of experts to assist the retailers with their sales and merchandising problems. Selling and merchandising need not be done on a regular weekly schedule.

This report discusses order taking, but does not take up methods by which salesmen can get new customers or build bigger volumes of business for themselves or the retailers. It assumes that the retailer is willing to buy from the particular wholesaler. The problem of reducing the cost of taking orders has been approached from at least three different viewpoints: (1) Reducing the amount of work done by salesmen and thereby the cost of the sales force; (2) increasing the size of orders so that the cost of taking them is proportionately less; and (3) reducing, and perhaps eliminating, calls on customers whose orders cannot be handled at a reasonable profit.

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Reducing the Salesman's Work in Taking Sales Orders

One way of reducing the salesman's work in taking orders is by increasing the proportion of business placed directly by the retailer without a visit from the wholesaler's representative. When the retailer places his order directly, a salesman can spend his time calling on other accounts or prospects, or the trade territory can be covered by a smaller sales force. In short, more business can be carried on with proportionately lower selling costs--provided, the basis for salesmen's compensation is adjusted appropriately.

Among wholesalers who have developed the idea, most direct orders are received by mail--the retailer fills out a printed (commonly called "pre-printed") order form and mails it in. A number of wholesalers do a large part of their business in this fashion. For example, one wholesaler issues a weekly price book to his retailers. The cover sheet of this book is an order form. Retailers place their orders by writing in the items wanted, tearing off the order sheet, and mailing it in. However, writing in each item is time consuming for the retailer and also leads to errors because of incomplete or illegible listing of items. Another wholesaler has overcome this disadvantage by issuing price books on which the retailer indicates his order by simply marking the quantity of each item he wants next to its description and then mailing in the entire book. In the latter case all items are described and given a code number. The code number and complete descriptions minimize the possibility of error resulting from faulty or incomplete writing and also permit ready translation to sales orders for office and warehouse processing. Both these wholesalers reported that they received excellent cooperation from retailers in ordering merchandise in these ways. (See examples of pre-printed order forms, figure 1.)

Wholesalers differ on the question of whether the use of pre-printed order forms results in a net saving in the cost of order taking. The disadvantages pointed out are that printing and mailing the forms are an expense and frequent price changes add to the cost, that salesmen must still make collections and must be paid for orders in their territory even when these are mailed in by the retailer, and that retailers will place larger orders when a salesman writes them up than when the retailer makes out an order form himself. Wholesalers who have been using pre-printed order forms feel that the advantages of the forms offset these objections.

Although wholesalers who use pre-printed order forms admit that printing and mailing is expensive, they feel that the cost is relatively small. Some wholesalers have installed their own duplicating equipment and report that forms are printed by a clerk in 1 to 2 days. The problem of keeping up with frequent price changes in the order forms has been handled in several ways. One wholesaler mails the forms semi-monthly but issues interim price changes on a day-to-day basis. Another wholesaler

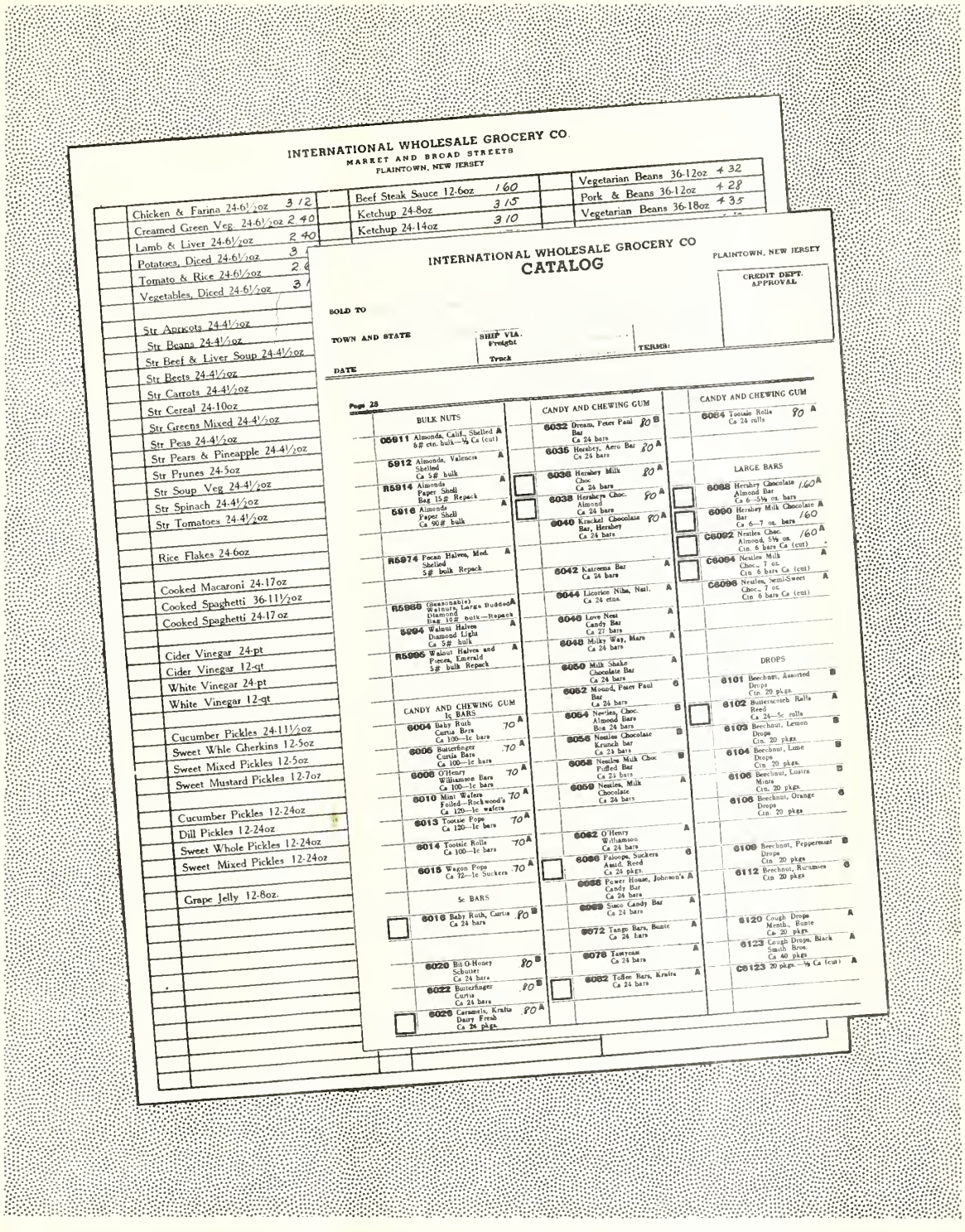
INTERNATIONAL WHOLESALE GROCERY CO.
MARKET AND BROAD STREETS
PLAINTOWN, NEW JERSEY
Chicken & Farina 24-6½oz 3 12
Creamed Green Veg. 24-6½oz 2 40
Lamb & Liver 24-6½oz 2 40
Potatoes, Diced 24-6½oz 3
Tomato & Rice 24-6½oz 2 6
Vegetables, Diced 24-6½oz 3
Str Apricots 24-4½oz
Str Beans 24-4½oz
Str Beef & Liver Soup 24-4½oz
Str Beets 24-4½oz
Str Carrots 24-4½oz
Str Cereal 24-10oz
Str Greens Mixed 24-4½oz
Str Peas 24-4½oz
Str Pears & Pineapple 24-4½oz
Str Prunes 24-5oz
Str Soup Veg 24-4½oz
Str Spinach 24-4½oz
Str Tomatoes 24-4½oz
Rice Flakes 24-6oz
Cooked Macaroni 24-17oz
Cooked Spaghetti 36-11½oz
Cooked Spaghetti 24-17oz
Cider Vinegar 24-pt
Cider Vinegar 12-qt
White Vinegar 24-pt
White Vinegar 12-qt
Cucumber Pickles 24-11½oz
Sweet Whle Gherkins 12-5oz
Sweet Mixed Pickles 12-5oz
Sweet Mustard Pickles 12-7oz
Cucumber Pickles 12-24oz
Dill Pickles 12-24oz
Sweet Whole Pickles 12-24oz
Sweet Mixed Pickles 12-24oz
Grape Jelly 12-8oz.
Beef Steak Sauce 12-6oz 1 60
Ketchup 24-8oz 3 15
Ketchup 24-14oz 3 10
Vegetarian Beans 36-12oz 4 32
Pork & Beans 36-12oz 4 28
Vegetarian Beans 36-18oz 4 35
INTERNATIONAL WHOLESALE GROCERY CO
CATALOG
PLAINTOWN, NEW JERSEY
CREDIT DEPT. APPROVAL
SOLD TO
TOWN AND STATE
SHIP VIA. Freight Truck
TERMS:
DATE
Page 28
BULK NUTS
05911 Almonds, Calif. Shelled A 8# ctn. bulk—½ Ca (cut)
5912 Almonds, Valencia Shelled A Ca 5# bulk
R5914 Almonds Paper Shell A Bag 15# Repack
5916 Almonds Paper Shell A Ca 90# bulk
R5974 Pecan Halves, Med. Shelled A 5# bulk Repack
R5985 (Seasonable) Walnuts, Large Budded Diamond A Bag 10# bulk—Repack
5994 Walnut Halves Diamond Light A Ca 5# bulk
R5995 Walnut Halves and Pieces, Emerald A 5# bulk Repack
CANDY AND CHEWING GUM 1c BARS
6004 Baby Ruth Curtis Boys .70 A Ca 100—1c bars
6005 Butterfinger Curtis Bars .70 A Ca 100—1c bars
6006 O'Henry Williamson Bars .70 A Ca 100—1c bars
6010 Mint Wafers Foiled—Rockwood's .70 A Ca 120—1c wafers
6013 Tootsie Pops .70 A Ca 120—1c bars
6014 Tootsie Rolls .70 A Ca 100—1c bars
6015 Wagon Pops .70 A Ca 72—1c Suckers
5c BARS
6016 Baby Ruth, Curtis .80 B Ca 24 bars
6020 Bit-O-Honey Schutter .80 B Ca 24 bars
6022 Butterfinger Curtis .80 B Ca 24 bars
6026 Caramels, Kraft's Dairy Fresh .80 A Ca 24 pkgs.
CANDY AND CHEWING GUM
6032 Dream, Peter Paul Bar .80 B Ca 24 bars
6035 Hershey, Aero Bar .80 A Ca 24 bars
6036 Hershey Milk Choc. .80 A Ca 24 bars
6038 Hershey's Choc. Almond .80 A Ca 24 bars
6040 Krackel Chocolate Bar, Hershey .80 A Ca 24 bars
6042 Katrema Bar A Ca 24 bars
6044 Licorice Nibs, Nat. A Ca 24 ctns.
6046 Love Nest Candy Bar A Ca 27 bars
6048 Milky Way, Mars A Ca 24 bars
6050 Milk Shake Chocolate Bar A Ca 24 bars
6052 Mound, Peter Paul Bar G Ca 24 bars
6054 Nestles, Choc. Almond Bars B Box 24 bars
6056 Nestles Chocolate Krunch bar B Ca 24 bars
6058 Nestles Milk Choc Puffed Bar B Ca 24 bars
6059 Nestles, Milk Chocolate A Ca 24 bars
6062 O'Henry Williamson A Ca 24 bars
6066 Paterpa, Suckers Assrd. Reed G Ca 24 pkgs.
6068 Power House, Johnson's Candy Bar A Ca 24 bars
6069 Saxo Candy Bar A Ca 24 bars
6072 Tango Bars, Bunte A Ca 24 bars
6078 Tastyeast A Ca 24 bars
6082 Toffee Bars, Kraft's A Ca 24 bars
CANDY AND CHEWING GUM
6084 Tootsie Rolls .80 A Ca 24 rolls
LARGE BARS
6088 Hershey Chocolate Almond Bar 1.60 A Ca 6—5⅓ oz. bars
6090 Hershey Milk Chocolate Bar 1.60 A Ca 6—7 oz. bars
C6092 Nestles Choc. Almond, 5⅓ oz. 1.60 A Cin. 6 bars Ca (cut)
C6094 Nestles Milk Choc., 7 oz. A Ctn 6 bars Ca (cut)
C6096 Nestles, Semi-Sweet Choc., 7 oz. A Ctn 6 bars Ca (cut)
DROPS
6101 Beechnut, Assorted Drops Ctn. 20 pkgs. B
6102 Butterscotch Rolls Reed Ca 24—5c rolls A
6103 Beechnut, Lemon Drops Ctn. 20 pkgs B
6104 Beechnut, Lime Drops Ctn. 20 pkgs. B
6106 Beechnut, Lustra Mints Ctn. 20 pkgs. B
6106 Beechnut, Orange Drops Ctn. 20 pkgs G
6108 Beechnut, Peppermint Drops Ctn. 20 pkgs B
6112 Beechnut, Rustmics Ctn 20 pkgs G
6120 Cough Drops Menth., Bunte Ca 20 pkgs A
6123 Cough Drops, Black Smith Bros. Ca 40 pkgs A
C6123 20 pkgs.—½ Ca (cut) A

Figure 1.--Examples of pre-printed order forms.

does not include prices on his sales order form which is mailed monthly. Instead, prices are furnished by the salesman on the day he calls to pick up the order. Both these practices obviate the need for frequent reprinting of order forms to keep them abreast of price changes. Some wholesalers save the cost of mailing order forms by including a copy with each order delivered. In this way, the retailer has the form when he needs it for his next order.

When retailers place their orders directly, wholesalers face the problem of handling collections. Traditionally, the salesman collects for an order when he picks up the next order. If a salesman must be employed to call on customers each week for this purpose, the potential savings of pre-printed order forms may not be fully realized. However, collections may be handled in several ways that do not require weekly visits by a salesman. For example, some wholesalers operate on a cash basis, collection is made on delivery or when the driver delivers the next order. This practice is especially prevalent among wholesalers who operate with voluntary retailer agreements. Other wholesalers invoice their customers and are paid by mail on a monthly basis or on some other fixed period basis. The particular collection method used by a wholesaler to avoid the necessity of weekly visits by salesmen, depends in large part on his own willingness to extend credit and on his relationship with his customers. Moreover, a wholesaler will probably want to handle the matter differently in a period when collections are difficult and with an account the credit rating of which is questionable, than at times when collections are readily made and with a retailer who is well established. The problem of collections then, need not prohibit the use of pre-printed order forms and the development of business in which the retailer places his orders directly.

The practice of paying salesmen on the basis of the volume of business done in their territories raises some difficulties when a portion of the business is turned in directly by retailers. Paying salesmen for such orders would virtually cancel any saving made possible by direct placement. There appears to be no unalterable reason for giving a salesman the same commission on orders mailed in as on those he sells by calling on the retailer. For example, by calling on each customer each week, a salesman may cover a territory containing 100 retailers and obtain a volume of orders on which he earns $100 a week. If 50 of his customers were to place their orders directly, the salesman might still be able to call on almost 100 retailers. He would be paid for the volume of orders obtained from the new and the old customers he visited regularly. He might then be paid his usual compensation for the customers whose orders he solicited and a smaller commission from those in his territory who mailed in their orders, thus bringing his total earnings above the previous amount.

Some wholesalers maintain that calling on retailers helps to get larger orders; that in ordering from a form, the retailer will buy fewer items. On the other hand, some wholesalers who use pre-printed order forms and have a mail order business say they get just as large orders by mail as by having salesmen take orders. They point out that the retailer can work up the order at his leisure; and that in looking through the entire order book he gets ideas of things to buy that he may not have thought of before. If it is the salesman's job to take orders, he may call when the retailer is too busy to spare the time necessary for the salesman to sell him additional merchandise. In any event, the salesman could not mention all the items in stock.

When orders are mailed in, it is necessary to make additional copies for use in assembling the order and invoicing at the warehouse. (Salesmen usually write orders in triplicate and thereby save the making of extra copies at the main office.) Where the wholesaler uses a mechanical accounting system, orders are transcribed whether written up by a salesman or a retailer; under such circumstances, there is no additional transcription cost arising from the use of pre-printed forms. Where order processing is done manually there is some compensation for the extra cost since items can be selected somewhat more efficiently when selection is made from the transcribed orders.

Mailing orders is a particularly efficient way of receiving orders from retailers located at a distance from the warehouse. The addition of a special delivery stamp can bring the order to the wholesaler as soon as--and in many cases sooner than if a salesman had brought it in or mailed it.

The study shows that the development of mail order volume is especially applicable where the wholesaler is well established and has built up a close relationship with his retailers (such as formally organized voluntary chains). Where a retailer has confidence in the wholesaler and is familiar with the products the wholesaler carries--private as well as national brands, nongrocery as well as grocery items--ordering by mail is feasible.

Even more important, where arrangements provide that the retailer buy from the particular wholesaler, it is this relationship more than a visit from the wholesaler's representative that makes for large and complete orders. Of course, under such arrangements, the wholesaler still has a merchandising job to do and in some ways a real selling job. That is, he must frequently sell the retailer on carrying the right items in the right quantities for his trade and on better ways of merchandising his wares. Moreover, he must anticipate price competition and violation of agreements by some retailers, which must be met by selling the long range as well as day-to-day advantages of the cooperating relationship. This kind of service and selling, however, can be and usually is separate from routine order taking.

On the other hand, where several wholesalers are actively bidding for the retailer's business, or the retailer is a relatively new account, mail order volume cannot be expected and even routine orders probably can be obtained only on the basis of personal calls.

Another way of increasing direct placement of orders by the retailer is to facilitate ordering by telephone. Among the wholesalers studied, telephone business ranged from 1 percent to as high as 20 percent of the gross volume of business. The cost of taking an order over the telephone is considerably less than the cost of a salesman's visit. Although wholesalers cannot depend on telephone orders for a major portion of their business, the work of salesmen can be reduced by increasing the proportion of business received in this manner. It is likely that regular customers, particularly those whose orders are not large, can be induced to place more of their orders by telephone. This can be done if wholesalers will install a system of order taking by telephone as a regular part of their order taking procedure and inform their customers of the advantages to them of telephoning their orders whenever possible. Moreover, if both the retailer and the wholesaler's order clerk work from pre-printed order forms which include full descriptions and code numbers, telephone orders can be taken quickly and accurately.

One wholesaler studied has been combining effectively a large cash-and-carry business with telephone orders. Some of his house salesmen have developed regular times for telephoning customers and taking their weekly orders. Many customers telephone their orders and then call at the warehouse to pick them up. This wholesaler reports the "will-call" procedure has proved efficient for both retailers and himself. Of course, a company must develop efficient ways of handling telephone and will-call orders along with the orders to be delivered or the interference of such orders with the regular routine may cancel the potential saving.

Still another expedient to simplify the salesman's job and to increase retailer cooperation in placing orders is to mail the printed order forms to the retailers in advance of the salesman's visit. It is often desirable for a salesman to renew cordial relations with his customer on each call but it is seldom necessary for the salesman to spend a large part of his time in pleasantries. Wholesalers who mail order forms to their customers prior to the salesman's scheduled call report that this saves salesmen's time without weakening their retailer relationship. They indicated that this procedure permits the retailer to decide what he wants and in many cases to have his order made up by the time the salesman calls. In such instances, the salesman does not have to spend time in writing the order or in waiting for the retailer to complete an order but frequently can pick up the order and be on his way in a few minutes. The time he does spend with the retailer, on the other hand, can be used almost entirely to build customer good will.

There appears to be a need for further study of the question of securing retailer cooperation in placing orders directly with the warehouse. Properly developed it might reduce substantially the cost of wholesaling groceries.

Increasing the Size of Orders at Each Call

The cost of taking orders also can be reduced by obtaining a larger or more profitable order at each visit. Many of the firms studied seek to increase the size of orders and the sale of more profitable merchandise by offering their salesmen commissions or bonuses in proportion to volume of sales or profitableness of orders. In some cases, commissions are a salesman's sole compensation and in other cases commissions represent only a part of his earnings. It is not within the scope of this report to discuss the relative merits of different bases of salesmen compensation. 1/ However, the point should be stressed: Some form of incentive designed to increase the size of each order rather than the over-all volume will probably result in a proportionately lower cost of taking (and processing) each order as well as a larger total volume of sales. The fact that so many wholesalers have some general system of incentive payments attests to the belief that salesmen can increase the profitableness of each visit.

Some wholesalers give a "bonus" to the retailer rather than to the salesman. Generally, such plans call for a discount on weekly orders or total orders for a month. Some wholesalers make special provisions for discounts on staples and low margin items. Although varying in details, all such plans are designed to give the customer an incentive to increase the size of his orders with the wholesaler and thus to reduce the cost of taking (and processing) the order. One wholesaler instituted a plan whereby retailers are allowed an increasing share of the wholesaler's gross profit as the size of their weekly orders increases. Checks for total bonuses earned are mailed each month. This wholesaler has had a good deal of success with the plan. He feels that it not only acts as an incentive for the retailer to increase his purchases from him, but also allows the wholesaler to pass on to the retailer the operational savings made possible by larger orders. The advantage of this plan to the wholesaler is that discounts are keyed to the profitableness of the merchandise bought and therefore he is assured of an adequate margin on which to operate.

One wholesaler operates a straight quantity discount plan based on the amount of each order. Total discounts are computed for each month and refunds are made to the retailer in the amount earned. On highly competitive low-margin items, this wholesaler works on a cost-plus basis, but even on these items the handling cost is lower on larger orders.

1/ For a brief discussion on the bases for salesmen compensation, see "Salesmen's Compensation Policies," by M. L. Lippitt, Wholesale Grocer News, May 1949.

The advantage of this type of plan is its simplicity of operation. Discounts can be readily computed and their relationship to purchases are easily understood. A principal disadvantage is that since profit margins vary between different items, the wholesaler is not assured of the overall margin he needs to operate at a fair profit.

These wholesalers and others offering similar customer bonuses usually have close working relationships with their retailers. Undoubtedly, this relationship of mutual confidence and good will accounts in part for the success of their programs. Properly developed and explained, such plans can do much to foster an appreciation of wholesaling costs and to build customer loyalty.

Voluntary retailer arrangements, too, are a means of increasing the size of orders and thereby reducing the cost of order taking. The merchandising and operating assistance offered by the wholesalers tend to make their retailers more loyal in placing orders. 2/ Voluntary chain retailers are usually a select group of stores and are more likely to recognize the mutual advantages of placing larger orders with one wholesaler. Frequently too, such cooperating arrangements improve the retail operation, thus making it feasible for the retailer to place larger orders. It should be noted, however, that the possibility of obtaining larger orders is only one advantage of a cooperative relationship between wholesalers and their customers.

Eliminating Calls for Unprofitable Orders

In an effort to reduce the cost of order taking (and processing), many wholesalers have begun to select their customers with greater care. Many of the wholesalers reported that they make a careful analysis of the cost of handling each account and of the gross profit obtained on each order. Cost and profit figures varied from one wholesaler to another. However, wholesalers who made a study of their operations found that a certain proportion of their customers were carried at a loss and that orders below a certain volume did not earn a profit. Weekly orders of less than $25 were found unprofitable by every wholesaler who made a study of handling costs. Some wholesalers who made cost analyses said that it is not profitable to accept orders of less than $50, and a few qualified the order size by setting a minimum gross profit that such orders should bring if the transaction were to be profitable.

It should be pointed out that dollar volume is not the sole criterion of a profitable order. However, most of the wholesalers felt that on the average the dollar volume was a good measure of profitableness.

2/ The report, How Some Wholesale Grocers Build Better Retailers, John H. Davenport and R. W. Hoecker, Marketing and Facilities Research Branch, Production and Marketing Administration, USDA, deals with this aspect of wholesaler-retailer relations.

Moreover, this is a figure the salesmen and retailers could easily understand and readily compute.

One wholesaler has established a minimum order in terms of cases of goods rather than dollars. He has established a minimum profitable order at five cases. Adherence to this minimum not only helps the wholesaler avoid costly small orders but also reduces the number of requests for less than case lots. Since the customer who frequently places small orders is also likely to ask for less than case lots, this plan has been a good alternative to a minimum dollar order. Five cases of groceries represent an average value of about $25 to $30, hence a minimum order in terms of cases of goods is also in effect a minimum dollar volume.

Servicing unprofitable orders and marginal customers is at the root of many other problems which confront wholesale grocers, and has been one of the principal reasons for basic changes in their operations. For wholesalers who have tried to continue doing business with retailers whose small orders could not be serviced at a profit, cash-and-carry operations have been one answer. 3/

Cash-and-carry operations have been developed either as part of the central warehouse or in connection with branch warehouses. Wholesalers usually make some special provisions at the main warehouse for handling cash-and-carry customers as, for instance setting aside a portion of the loading space for this trade and simplifying the paper work involved in processing the orders. In the main warehouse, cash-and-carry orders are usually assembled in the same manner as the service orders although provision may be made to expedite orders for which customers wait.

Some wholesalers have built up large cash-and-carry volumes by stressing this aspect of their business and by making adequate arrangements to accommodate cash-and-carry trade. Savings are made possible by eliminating the sending of salesmen to solicit the business and eliminating credit arrangements on deliveries. However, the weakness of such business is that by not sending a representative to call on a retailer the wholesaler may lose contact with him and thereby eventually lose his business. Moreover, when cash-and-carry trade, like will-call orders, is carried on in the same warehouse with service orders, it can

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3/ Some wholesalers have met the problem of unprofitable orders by installing a cost-plus system of pricing. However, none of the wholesalers included in this survey had such a system. For those wholesalers who have seen the solution as better and more loyal retailers, voluntary retail agreements have been one solution. The purpose of voluntary chains (and other forms of cooperating retailers) is to build up a group of better-than-average retailers whose orders will be relatively large and thus can be processed at low cost and a fair profit.

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interfere with the regular order processing and thereby increase the cost of handling these orders. Finally, cash-and-carry business usually can be obtained only from retailers who are relatively near the warehouse; therefore, the problem of handling small orders from more distant customers is not solved.

Some wholesalers have directed their cash-and-carry business to branch warehouses. Cash-and-carry branches are frequently operated more like retail self-service grocery stores than wholesale establishments. Although stocks are often displayed in very plain surroundings with the emphasis on low-cost handling, some wholesalers have designed attractive showrooms for their cash-and-carry trade. The customer often selects his own merchandise and orders are written up and paid for at check-out counters. Cash-and-carry branches have proved particularly helpful where wholesalers are attempting to serve a large trade territory.

The problem of building up marginal customers and eliminating unprofitable orders is frequently one of finding out why orders are divided among different wholesalers or placed in such small amounts. Few retailers are so small as to make servicing unprofitable if they did most of their business with one wholesaler and placed their orders only once a week. A retailer may deal with several wholesalers because he feels that this practice broadens his credit or makes it possible to keep smaller inventories by getting more deliveries each week. He may order in small quantities to avoid overstocking on particular items or to maintain a good stock turn ratio, or he may simply buy specials offered by different wholesalers. Where the reasons for uneconomical buying practices are known, the salesman can often show the retailer the advantages of better buying practices. For example, many retailers overlook the cost of having to spend their time with a number of salesmen and drivers when they place small orders with various firms.

Some wholesalers feel that a charge should be made for servicing small orders to help cover their additional cost. Such a charge would permit the wholesaler to handle the order without losing money on it and would also acquaint the retailer with the fact that it is uneconomical to service small orders. One firm added a service charge of $0.50 per order and included this charge on the invoice. Begun in the 1930's, this practice continues to be helpful.

As a last resort unprofitable relations may be eliminated by discontinuing calls on the particular retailer. Some of the wholesalers report that they simply inform their salesmen of accounts that are not profitable and instruct them to bring the orders up to a profitable level if possible or to drop the retailers from their routes. The salesman can tell his customer that unless he gives him a larger part of his business or places several of his orders together, the wholesaler will be unable to service him. Wholesalers reported that, when properly informed, the retailer often recognizes the need for correcting his buying practices and thereby becomes a profitable customer.

Each wholesaler must determine whether he can profitably continue to service retailers whose individual orders are small. Such determination must be made on the basis of overhead, as well as direct costs of servicing each order. Net profit can be increased even with reduced gross sales--providing operating expenses are cut sufficiently.

One method of analyzing costs as a basis for determining the effect of servicing unprofitable accounts is given in a U. S. Department of Commerce bulletin published in 1941. 4/ Briefly, this method calls for the following steps: (1) Measuring the amount of expense which should be allocated to a customer for each wholesaler operation such as sales calls, deliveries, invoice lines; (2) distinguishing overhead from direct expense which is to be allocated to each order and determining the amount of overhead expense which may not be eliminated with the order; (3) totaling expenses thus established for all marginal orders processed during a selected period; and (4) comparing expenses thus computed against gross margin obtained from those orders. Precise measurements of this kind require some time studies and effective cost accounting, but the information may well be worth the effort.

However, after determining that one or a group of accounts do not add to net profit, considerations of potential volume and relation to the business as a whole may yet make it worth while to service them. For example, a new retailer or one developing a store in a growing neighborhood might be given special consideration for a period of time on the expectation that the size of his orders will grow as his business grows. Almost every wholesaler can cite instances of winning customer loyalty and increased business by cooperating with new grocers who show promise.

Besides considering a customer's potential worth, wholesalers take into account his location in the sales territory and his bearing on overhead before concluding that calls upon him are unprofitable. Thus, although many accounts might not seem profitable because the direct costs of selling or delivering to them is high, the amount of such business in total might help to cover the overhead on selling costs and warehousing and thereby help the profit position of the business as a whole. Similarly, a store or stores located among profitable customers can be called upon with relatively little extra cost by the salesman visiting the profitable firms. Moreover, eliminating a group of retailers who are unprofitable may isolate one or more profitable concerns and may make it unprofitable to call on them as well. These are considerations which wholesalers must take into account after cost analysis locates the stores which are presently being handled at a loss.

Some wholesalers have difficulty recognizing that any business can be unprofitable. It is true that a small wholesaler can frequently eke

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4/ William H. Meserole and Charles H. Sevin, Effective Grocery Wholesaling, U. S. Dept. of Commerce, Bureau of Foreign and Domestic Commerce Economic Series No. 14.

out a profit on even small orders. By trimming services, an enterprising wholesaler may do a reasonably profitable business with the small retailers not solicited by other wholesalers. Nevertheless, the feeling in the trade is that all would benefit if it were generally recognized that retailers who divide their business among too many wholesalers or who persist in placing small orders, cannot be handled at a reasonable profit by any service wholesaler and that by continuing to serve them the cost of distributing grocery products to all retailers is increased.

Some Ways of Increasing the Efficiency of Paper Work In Processing Sales Orders

The job of processing sales orders can be described in two parts: (1) The order routine or paper work; and (2) the order selection and assembling. The first includes all the steps necessary to price and extend sales orders, furnish order men with copies of the order for assembling, make adjustments for out-of-stock items and invoice the customer. The second includes the work necessary to select and assemble the required items, check the assembled order for correctness, and, usually, load it on the delivery trucks.

There are many ways of doing these jobs. However, there are two basic systems--one based on manual operations, the other mechanized as far as possible and designed around the use of punch cards and tabulating machines. In the manual system the salesman usually writes up sales orders in triplicate, one copy being used in the office for invoicing (and usually posting), another going to the warehouse for assembling, and the third being used as a delivery receipt. Out-of-stock items are noted by the order men and the office copy of the order is corrected accordingly. Transcription of the sales order is unnecessary unless many copies are needed to expedite assembling from several floors. For cash-and-carry or will-call orders, the delivery copy is usually not prepared.

The mechanized system usually starts with a pre-printed order form on which only the quantity of the wanted items is written in. This form is turned in by the salesman or mailed in by the retailer. Out-of-stock items are noted by reference to a unit inventory control file in the office before the order goes to the shipping clerk. (This inventory control file, which generally contains a punched card for each unit of merchandise in the warehouse, is the core of the tabulating system.) The original order is transcribed mechanically to produce one copy of the order for assembling and one for invoicing. This operation is accomplished by pulling the punched card for each unit of an item specified in the order and running these cards through a tabulating machine together with the customer's card, salesman's card, and a date card.

Efficiencies in both paper work and order assembling may be accomplished with or without a tabulating equipment system. While this study has been little concerned with office operations, some ways of reducing

costs of paper work were noted among the wholesalers who did the job manually.

Reducing the Expense of Checking Sales Orders

The cost of checking sales orders can be reduced by having routine work done by office clerks rather than salesmen or company officers. Among wholesalers who have their salesmen enter prices, sales orders are often reviewed by an assistant manager or buyer to see that pricing is correct, that is, to see that firm prices are being maintained or that, where permitted, only authorized price changes are made. In most cases, this review can be accomplished by clerical personnel almost as speedily as by officers whose time costs much more. Where one or two clerks are assigned the task of price checking, they can become very proficient—even where prices are changed from time to time. Of course, the decision as to what should be done about unauthorized price changing should be left to a company officer—especially if it entails an interview with the salesman.

Costs of price checking also can be reduced by a sample inspection of sales orders written by each salesman. It appears likely that a check of every order written by every salesman is unnecessary. The salesman who persistently uses wrong prices can be found by daily checking a few of the orders each salesman turns in. There are statistical formulas which can tell what proportion of a salesman's orders would need to be checked to be reasonably sure that not more than two or three out of a hundred such price changes would get by. Where the purpose of checking is to catch occasional errors that salesmen make inadvertently, a record of errors that are found will probably show that some salesmen are more likely to make errors than others. The orders of salesmen who are error prone might then be checked more closely than those who almost never make errors. It must be recognized that not all price errors can be eliminated, and that checking and rechecking does not eliminate every one but only assures that fewer get through.

Reducing the Number of Forms Used

Another way of increasing efficiency in sales order paper work is to reduce the number of forms used. Most wholesalers studied used three copies of the sales order in processing. The triplicate form assumes that one copy is finally used as the posting medium, that the retailer must get a copy for his files, and that he initials a copy to indicate receipt of the goods. One wholesaler extended the practice of his cash-and-carry business to his service trade, taking no delivery receipt; therefore preparing only two copies of the order. He found that the absence of a receipt did not increase the number of complaints on orders.

One wholesaler used one copy of the sales order for assembling small items listed and another copy was used in assembling the bulk of the order. This made for efficient order assembling; however, since the copy used in assembling the small items was returned to the office and then discarded,

this same purpose could have been served by the original copy which had remained in the office while the other items were being assembled. Of course, if the original copy was being added and extended during this time, the extra copy would expedite processing.

The presence of two copies in the office files--when only one is needed for record purposes--usually suggests that full multiple use of forms is not made. This is one way in which management can get an inkling that too many forms are being prepared. These examples merely suggest areas in which efficiencies may be introduced in the paper work of processing sales orders. Means of accomplishing real savings in this area could probably be uncovered by more intensive observations of the way in which the forms are handled and an analysis of the use to which each copy is put. There is a need for more study to streamline office procedures in wholesaling.

Using Tabulating Equipment

Wholesalers who use tabulating equipment report some savings in man-hours over the manual procedures they have previously used in their sales order routine. These savings arise, in part, because the time of manually pricing and extending each order is saved, and copies of the order for assembling and invoicing are printed mechanically with adjustments for out-of-stock items made at the same time. (Fig. 2.) Full and efficient utilization of a tabulation system in processing sales orders requires a pre-printed order form since it facilitates selecting cards for each item. A firm (though not necessarily fixed) price policy is also helpful since a new card must be punched for an item each time its price is changed. Where these practices are possible and the volume of business warrants, it appears that man-hours can be cut and in some instances, a net saving earned by the tabulating system of handling orders from receipt to invoice. It should be borne in mind that users of such systems emphasize their advantages in streamlining warehouse as well as office procedures and in making available information for inventory control and sales analysis not readily available otherwise.

Some Ways of Effecting Savings in Assembling Orders

Two ways in which savings may be effected in assembling orders are better physical arrangement of stock in the warehouse and improved procedures in assembling orders. This report deals with warehouse stock arrangements and operating practices only as they directly affect the efficiency of filling orders. The discussion deals primarily with the kind of arrangements and procedures which appear most efficient for the middle-size wholesaler processing the kind and size of orders placed by independent retailers. 5/

5/ For a discussion on warehousing arrangements for the larger wholesale grocers and those doing business with chain stores, see Modernizing and Operating Grocery Warehouses, U. S. Dept. of Commerce publication, Domestic Commerce Series No. 26, 1951.

TELEPHONES
MAIN · 5000
MARKET · 2220

INTERNATIONAL WHOLESALE GROCERY CO.
MARKET AND BROAD STREETS
PLAINTOWN, NEW JERSEY

INVOICE NO. **7623**

DATE MAY 10 19--

CUST. NO. 4352

TO GEORGE J SMITH
2342 ST JAMES AVE
ELIZABETH N J

PIECES	ITEM	SIZE	PACK	CODE	% PROFIT	S. R. P.	PRICE	EXTENSION
1	KRAFT PIM CHEESE	1/4 LB	10	1012	21	18	1 43	1 43
1	KRAFT AMER CHEESE	1/2 LB	10	1014	21	18	1 43	1 43
1	SEABOARD MUSTARD	20Z	48	1148	31	5	1 65	1 65
1	MABCO ICE CR CONES		250	1232			67	67
1	SCHIM JELLY GRAPE	16OZ	24	1274	16	15	3 02	3 02
1	HIRES ROOT BEER	26OZ	12	1616	23	15	1 39	1 39
1	WELCHS GRAPE JUICE	QT	12	1646	22	43	4 05	4 05
1	S SWT PRUNE JUICE	32OZ	12	1718	25	19	1 70	1 70
3	CAMP TOM JUICE	14OZ	48	1760	22	2 / 15	2 80	8 40
1	PHILLIPS STG BEANS	2	24	2326	37	9	1 37	1 37
10	STANDARD TOMATOES	2	24	2700	27	8	1 40	14 00
1	DERBY ANCHOV ASST	20Z	20	2733	28	15	2 15	2 15
1	MORTON BEEF STEW	1	24	3058	25	12	2 15	2 15
1	CLAPPS BEEF BROTH	4 1/2OZ	12	3080	29	9	77	77
2	RED HEART ASST	1	48	3182	25	9	3 25	6 50
6	CAMP VEG SOUP	10 1/2OZ	12	3343	20	10	96	5 76
10	HORMEL VEG SOUP	16OZ	24	3356	19	10	1 95	19 50
1	KELLOGG ALL BRAN	11OZ	24	3462	20	13	2 50	2 50
1	CREAM OF WHEAT	14OZ	12	3479	14	15	1 55	1 55
1	YELLOW MEAL GRAN	10LB	1	3565	33	40	27	27
5	BISQUICK	20OZ	12	3736	20	18	1 72	8 60
1	FRENCH INSTANT TAP	8OZ	24	4090	19	10	1 95	1 95
1	KINGS CORN STARCH	1LB	24	4506	19	11	2 15	2 15
1	JELLO CHERRY		36	4658	28	6	1 55	1 55
1	JELLO LIME		36	4662	28	6	1 55	1 55
1	JELLO STRAWBERRY		36	4668	28	6	1 55	1 55
1	JUNKET TABLETS		12	4786	26	14	1 25	1 25
1	MORTON DATE PUDDING		24	4802	23	10	1 85	1 85
1	VELVET TOBACCO		12	5014	20	2 / 25	1 20	1 20
59				1515				101 91

Figure 2.--Example of form for assembling orders and for invoicing prepared by mechanical accounting equipment.

Arranging Stock to Facilitate Assembling Orders

Among warehouses visited, three practices in stock arrangement stand out as facilitating the work of order men: (1) Arranging the stock in some systematic fashion--usually in the same sequence as the items appear on the order; (2) minimizing the "ton distance" covered by order men through such means as stock arrangements with reserves and selection lines, having items with fast turnover nearest the aisles from which the order men operate, having heavy bulk items nearest the shipping area, and similar arrangements which reduce the distance covered and weight carried by the order men; and (3) minimizing the costs of dealing with special order requirements--handling small items, broken cases and small orders.

The arrangement of stock in the warehouse is affected, in part, by the kind of orders the wholesaler is called upon to fill most of the time. For example, a wholesaler doing business with many small accounts probably will need to fill many orders with less than case lots and a separate room for handling split cases may not be as efficient as keeping them with the regular stock. Again, a large wholesaler doing most of his business with a relatively small number of cooperating retailers commonly fills large orders and will find palletized stocks and a selection line allowing easy access to a large number of items efficient for his order assembling. Certain kinds of orders are costly to assemble with any kind of warehouse arrangement but, on the other hand, certain warehouse arrangements are inefficient in filling any kind of order.

Systematic stock arrangements can help order men fill almost any order with less waste motion. By arranging stock in some systematic fashion, the chance of missing particular items is minimized and the necessity for back tracking or for time-consuming search is considerably reduced. Moreover, lacking such a system, order men must either try to organize their itinerary by carefully scrutinizing each order as they get it or move about the warehouse in almost haphazard fashion. Although an order man will develop habitual ways of canvassing the warehouse where no fixed sequence is given him, each trip requires him to make a number of decisions, such as: Which aisle to cover first? Which item in this part of the floor should be picked up next? And each decision, no matter how inconsequential, takes time. Moreover, the answer as to which is the better way is left to the order man, and he may not always think in terms of relative efficiency.

Wholesalers who transcribe their sales orders, for example as part of a tabulating system, can profitably arrange their stock in the sequence in which it will be reproduced on the order assembly copy. 6/

6/ A transcribed copy of the sales order is, itself, frequently helpful in selecting items owing to greater legibility and more complete descriptions than the original order written by the salesman. This is one of the advantages of a tabulating system in which the copy of the order is mechanically printed and available for selecting and order assembling.

Such arrangement gives the order men a fixed and orderly way of going about the warehouse in selecting the required items.

In every warehouse visited, the stock was arranged in some systematic way. All systematic arrangements of stock include the grouping of like items, that is, all cereals are kept together, all canned fruits and vegetables are together, and so on. In some instances, this practice is carried further. One wholesaler doing a substantial business with institutions, has grouped together all canned goods of institution size, thus simplifying the job of filling orders for institutions. Similarly, keeping the several hardware or houseware items together may facilitate selection for those retailers whose orders usually include such articles. An analysis of the trade served, and the kind of orders usually assembled, may suggest other efficiencies in arranging stock.

Some wholesalers have their shipping clerk mark the aisle in which each item is carried before turning over the order to the selector. Aisle marking is important where the position of stock in the warehouse is subject to frequent change, or where the order man is not familiar with the arrangement of stock. However, where stock is arranged in some systematic order, such as in sequence to code numbers or to sales order forms, the order man has sufficient guidance for collecting the items without having the aisles marked.

In small warehouses systematizing of stock beyond grouping of like items may not prove much more efficient. Similarly, where the same men have been assembling orders for years and stock arrangements vary little, more systematic stock arrangements may not bring commensurate savings in order assembling. Nevertheless, even in such firms, some consideration should be given to long term needs of the company.

Reducing the "ton-distance" covered by order men is another basic practice in warehousing that facilitates the work of order men. The principle is to arrange stocks in such a fashion that for any given order the selector will have less distance to cover and less distance to move the tonnage assembled. One example of this followed by many wholesalers is to separate the storage from the assembling areas of the warehouse. Most wholesalers reported that reserve stock and selection line arrangements speed order assembling. Order men have less ground to cover when superfluous stock does not take up space on the floor where orders are being assembled. If one-fourth of the warehouse is devoted to reserve stocks, the area which the order man covers in selecting items is proportionately less.

The kind of reserve stock and selection line arrangement to be used depends, in large part, on the individual wholesaler--the kind of warehouse he has and the kind of equipment available. 7/ The principle followed is

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7/ The physical arrangement of stock in selection lines is discussed by John R. Bromell in a U. S. Dept. of Commerce Publication, Modernizing and Operating Grocery Warehouses, Domestic Commerce Series No. 26. 1951.

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to have goods on the selection line as accessible as possible and to keep reserve stocks at a greater distance from the loading area. In multi-story warehouses, reserve stocks are typically kept on the upper floors and on each floor farthest from the elevator and chutes. In single-story warehouses, reserve stocks are similarly kept in the less convenient areas of the building or on the upper level of a multi-deck line.

In warehouses with relatively small floor space and relatively small stock the advantages of reserve stocks and selection lines are less evident. The cost of moving merchandise from reserve to selection lines may offset the savings in assembling orders.

A second practice is to have items most frequently called for stocked nearest the aisle from which the order men operate. The purpose of this arrangement is to save order men the time of going down secondary aisles for items frequently picked while bypassing main aisle items seldom selected. Wholesalers reported that this practice cannot be carried out for all items throughout the warehouse. In the first place, there is the problem of determining relative frequency of sale for all items. Although turnover can be obtained for a given period, rates may vary from season to season for some items and from year to year for others. Moreover, the difference in frequency of sales may be so small for a group of products that it would matter little which were on the main aisle and which were down the secondary aisles. Then there is the added work of moving merchandise in order to maintain stocks in an arrangement corresponding with the turnover rates. Accordingly, it would appear advantageous to take turnover into account primarily where there are considerable differences, where these differences are likely to persist for some time, and where alternative main aisle and secondary aisle positions are available (thereby avoiding additional stock shifting).

Another practice designed to minimize "ton distance" is to stock heavy items as close to the loading area as possible. Thus, large bags of sugar are stocked on the main floor in some warehouses. This practice is especially common during the canning season when high turnover makes it even more important to keep sugar readily accessible, and as near the end of the selection line as possible. In this way, it can be added to the hand truck when the order is ready to be wheeled into checking or loading position. Since space near the loading area is limited, wholesalers will want to review the needs of their trade from time to time to ascertain whether this space could be used more effectively in terms of "ton distances" involved.

The cost of handling special order requirements is minimized by assembling practices especially developed to deal with them. Special order requirements include requests for small items, split cases, and small orders. Among the wholesalers there was a feeling that separate handling of small items increased the efficiency of assembling most orders. This practice is especially desirable where many orders do not include small items or where there is some danger of pilferage. Most of

the wholesalers reported that it is more efficient to have items such as chewing gum, drug items, tobacco, and so forth, kept in a separate section or room of the warehouse and have a special selector collect these items for all orders. Such items are usually assembled before, or simultaneously with the rest of the order, and are sent down to the shipping area to await the bulk of the order.

One advantage of handling small items separately is that one person can specialize in this job and can learn to collect and assemble many small items rapidly. Another advantage is that when put together in a single carton, the many small items can move as a single package in subsequent handlings. Finally, there is much less chance that some of those items will be overlooked in the general assembling of the order or that a small package may be lost or damaged in the course of collecting a large order. One wholesaler who does not have a separate small item section has the order men package several such items in a single carton to avoid loss of time and goods.

The handling of split cases has also received special attention by wholesalers. Because it is usually uneconomical to handle split cases in the regular order filling routine some wholesalers discouraged requests for less-than-case lots by charging a higher price for splitting a case and by setting minimum size orders in terms of full case units. Other wholesalers honored requests for less-than-case lots but only on special merchandise. Despite these efforts the problem of dealing with split cases remains.

One way in which the cost of handling split cases has been minimized is to set these cases aside and handle them apart from the full case merchandise. Separate handling is accomplished in different ways. One that appears particularly effective is putting the broken cases in a part of the warehouse set aside for cash-and-carry customers. This procedure frequently makes it unnecessary to repackage the merchandise. Many of the cash-and-carry retailers want to buy merchandise in such quantities, and in assembling and transporting a small order the open cases can be handled without damage.

One wholesaler followed the practive of setting broken cases aside and reassembling them in a special repacking room. Where there is little opportunity to sell less-than-case lots, this practice appears sound. It permits the wholesaler to bring the merchandise back into regular stock and the regular assembling operation. Handling broken cases in some separate way also means that one person can give close attention to open cases and damage and pilferage can be minimized.

Small orders, too, have received special treatment by some wholesalers. Despite the steps taken to reduce the number of small orders, they persist as a part of the wholesale grocery business. To meet this problem, one wholesaler has the shipping clerk group small orders from individual salesmen. Instead of having the orders assembled as each is

turned in, he has the order man collect the items for all the orders at the same time. Sometimes, he has as many as 15 small orders assembled at once. In this way several small orders can be filled in little more time than it would take the order man to move around the warehouse collecting any one of them. Although this practice may introduce the problem of sorting after the orders are assembled, the wholesaler reports that it has resulted in a net gain for him.

Wholesalers who have serious problems in connection with small orders might consider the possibility of having small orders of one day held over until the following day. Then, by pooling the small orders of both days, several may be assembled at the same time with resulting economies of time and effort. Of course, many retailers who place small orders telephone them just before a scheduled delivery to their store, and supplemental or "evening up" orders are placed even by large customers. Where these requests are received by a more or less fixed time before the scheduled delivery of the regular order, it appears reasonable to process them immediately. The savings which may result from assembling several small orders at the same time would be lost if such practice necessitated extra deliveries. Wholesalers can discourage many late orders and thereby reduce the cost of assembling them by advising customers when delivery cannot be made immediately. The retailer may be given the alternative of foregoing the order or permitting the wholesaler to assemble (and perhaps deliver) the order at a time when it can be done more economically. In many cases, the retailer does not expect immediate service on such an order and will readily accept a reasonable delay. Of course, delaying deliveries will help hold down costs only if those deliveries are ultimately made on regular delivery schedules.

Improving Methods of Assembling Orders

The practices a wholesaler develops for assembling orders, like his arrangement of stock in the warehouse, is in part determined by his relationship with the retailers. For example, where deliveries are made twice or three times a week instead of once a week, it may be necessary to assemble half again as many orders each week. Where several of the trucks must leave very early in the morning to cover outlying routes, it may be expedient to employ a night shift to assemble orders and load the trucks. This report discusses certain efficiencies in assembling orders which are applicable to most wholesalers and some practices which are employed to handle special problems arising from a wholesaler's particular relationship with his customers.

Simplifying the checking of orders after assembling is one way in which wholesalers have increased the efficiency of the assembling operation. Although it is important that orders be correctly and completely filled, necessary care does not require duplication of work nor spending an excessive amount of time to catch a very few errors. If one accepts the idea that all the checking and rechecking does not eliminate every error but only makes sure that few will get by, the question is raised: How much checking should be done?

An example of excessive order checking may be mentioned as a partial answer. One wholesaler has orders checked by the men as they pick the items and also by a specially designated order checker. This is a double check on both items and on number of cases. The shipping clerk then verifies the case count of the checker, and the driver again verifies the case count when he loads the order into the truck. This makes four separate verifications of the goods assembled. The shipping clerk in this instance remarked that weeks go by in which he does not find a single error. If this is true, the work of the shipping clerk in checking the case count would scarcely be warranted. Any check that fails to find some errors regularly is probably unnecessary.

One way of deciding whether a particular kind of check is worth while is to determine how much it costs to find an error by this method and weigh this cost against the need to eliminate such errors from a customer's order. For example, a shipping clerk spends 2 hours a day rechecking orders by making an item count, and in a week he catches two mistakes. If he is paid $1.50 per hour, it costs $7.50 to find one such mistake; and if the company dispatches 1,000 orders per week, he catches one mistake in the items included in 500 orders. If a grocer receives two deliveries a week (about 100 per year), the chances are that this check would catch only one such error in 5 years' deliveries to him. Most wholesalers will agree that this kind of precaution is scarcely worth its cost.

Besides catching and correcting mistakes that are actually made, checking work of order men has the purpose of keeping them from getting careless. A systematic check-up on a sample of the orders assembled by an order man is usually enough to keep him from being careless and may well replace some of the checking that is done on every order. Moreover, a sample check-up can indicate which order men make frequent errors, and since a few employees probably account for most errors, retraining and reassigning these few order men may do as much to reduce errors in the over-all operation as additional checking. Thus, in developing a system of order checking two things should be kept in mind: (1) Any check should pay its own way in the number of mistakes it uncovers; and (2) a sample inspection of work done by each order man frequently can be as effective in detecting those who are careless or error prone as a check on all work done.

A word of caution may be added on introducing a system of sample inspection. First of all it is advisable to check the quality of work being done to make sure that all order men are reasonably accurate and to reassign any man who is making many mistakes. Sample inspection is effective in maintaining the quality of work within acceptable error rates; it is not effective in reducing the number of mistakes that are being made.

One wholesaler has done away with the double check practice by using a system of marking off packages just before they are loaded on the truck. No prior check by the order man or shipping clerk is called for. The procedure used is to load flats on which orders are assembled so that two side faces of the cases can be seen. One person calls the items from the sales order while a person on each side of the flat marks each unit with a crayon. The wholesaler reported that this single checking system has proved to be much faster and only a little less accurate than the usual multiple check system. This procedure could be improved from a cost standpoint by using only one checker. The caller could check one side of the truck as well as read from the order. Some wholesalers maintained that a single check of this kind made by the shipping clerk after the order is assembled is all that is needed.

There has been some successful experimentation with mechanical devices to reduce the time and expense of checking orders. 8/ In one experiment, recording and transcribing equipment was used to eliminate a checker at the time of loading. In the conventional manner, a three-man team was employed, one to call the items, one to place them on a conveyor belt in the sequence called, and one to remove items from the belt and stack them in the truck. In the experimental procedure, all the orders were first recorded by an office clerk, item by item, in the sequence in which they were to be loaded on the truck. Then the record which had been made was transcribed through speakers at the loading platform at the time loading was done. The loud speakers could be turned on and off by the loader, therefore, the presence of a checker was unnecessary. The time of recording orders was only a small fraction of the time previously taken to call the items off, since under the old procedure checking had to be timed to the speed of loading. Although the new procedure was primarily developed for operations of produce wholesalers, the idea may be adaptable to some grocery wholesalers as well. Some study along this line may be profitably made.

Obtaining optimum utilization of the warehouse force and equipment is another way in which wholesalers are combating rising costs. Integrating operations and balancing working crews and equipment are means of reducing the overhead of plant and equipment and minimizing standby time.

Integrating operations means organizing the work so that each part of the job is timed to make most efficient use of plant and personnel. An example followed by many wholesalers is assembling orders at night to dovetail order assembling time with the time of delivery truck loading and car unloading. This makes it possible for drivers to arrive in the morning and immediately take their trucks out for deliveries. Thus

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8/ For a detailed report, see Agriculture Information Bulletin No. 43. Use of Recording and Transcribing Equipment in Loading Delivery Trucks of Produce Wholesalers, 1951.

trucks are out making deliveries almost every hour of the delivery day—instead of being tied up in loading a part of the time when they could be on the route. Stops may then be covered with fewer trucks. A night shift also means that materials-handling equipment used in order assembling and loading is free during the day for receiving and storing merchandise; therefore, fewer pieces of equipment may be needed. (See fig. 3.)

In another example, orders are assembled during the day while trucks are out on the routes; orders are then ready for loading onto the trucks when they return. The trucks are garaged fully loaded and ready to move out the first thing in the morning. This practice is good where a night shift is not feasible.

One wholesaler reported that he had organized the job of assembling orders into several evening and nighttime shifts. For example, the man in charge of the small package room for this wholesaler reports for duty at 9 p.m., packs the items in the small package room, and brings his merchandise to the shipping floor order by order. At 11 p.m., the night foreman and two men report for work. They take the first orders which have passed through the small package room and move from floor to floor through the warehouse assembling the bulk of the order. Both the small package room man and the men who immediately follow him number the packages by customer so that when the packages arrive at the shipping area the entire orders can be assembled. The sorting and preparation of orders for loading onto the trucks is done by a sorter who reports for duty at 12 midnight. At 3 a.m., the checker and the first driver (the one having the longest route) arrive and begin to load the first truck. This practice continues through the night until all orders are assembled and the last truck is ready to depart in the morning.

The purpose of integrating operations is to make sure that one group completes its work in time for the next group to start and that no loss of time is incurred between operations. Few things are so destructive of working morale and high productivity as periodic stretches of standby time. Of course, against these advantages must be reckoned the possible extra cost or lessened efficiency of night work (or any other arrangement requiring extra help or more than one shift).

Another basic idea in efficiently organizing men and equipment is balanced handling. In an operation requiring that a group of men work together and use materials-handling equipment in common, the number of personnel on each part of the operation and the number of pieces of equipment they use should be balanced so as to minimize standby time for any individual in the group. The need for balanced handling is especially apparent in receiving goods, assembling orders, and in loading delivery trucks.

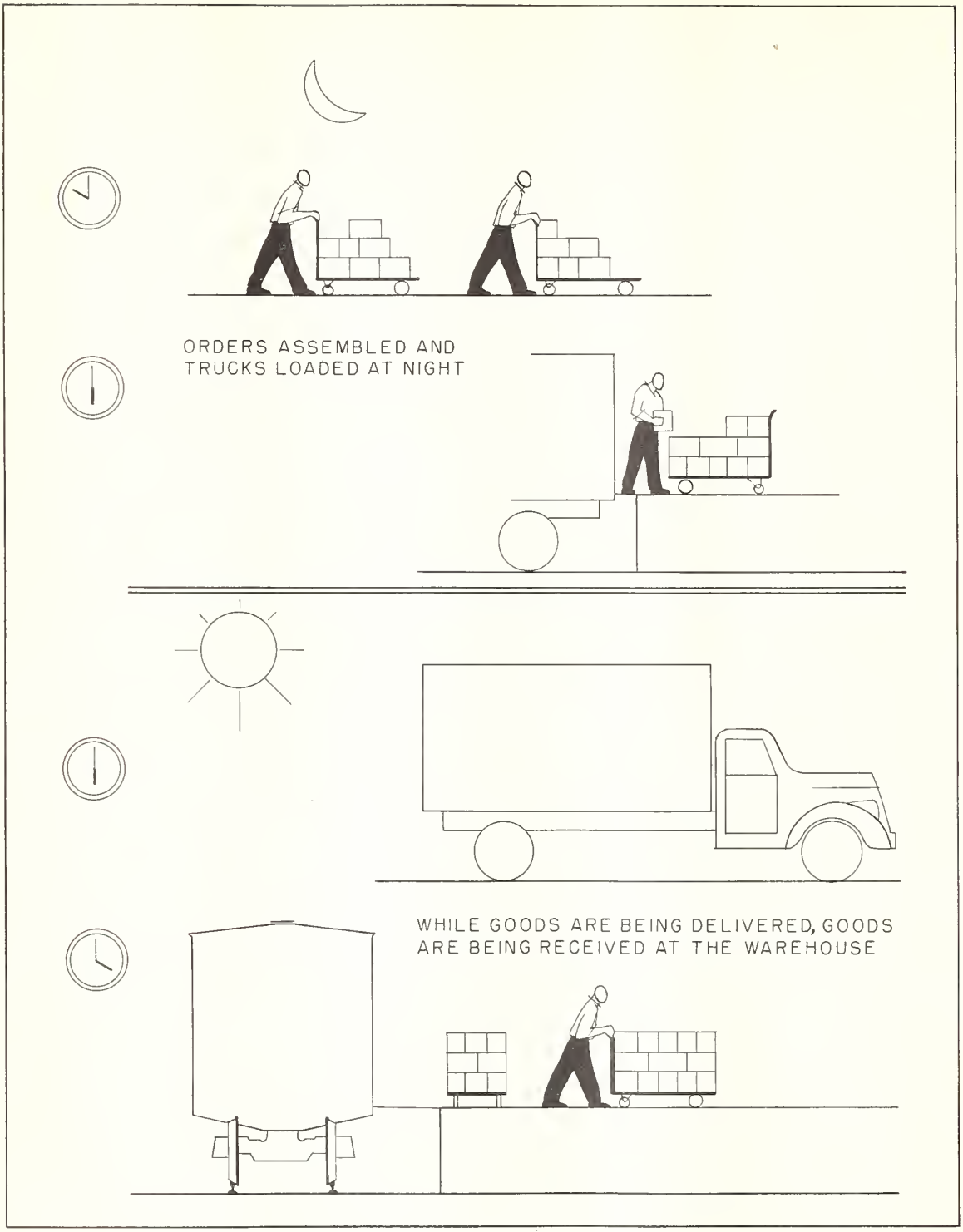

Figure 3.--Integrating operations.

One example of unbalanced handling often found in multi-story warehouses arises because of inadequate facilities for moving merchandise between floors. In some warehouses one or two elevators provide the only means to take a truck to another floor. In such cases, order men must often stand by and wait when they go from floor to floor assembling an order. A study of man-hours wasted in such warehouses probably would indicate a need for additional facilities for moving merchandise between floors. Where additional facilities are not feasible, some wholesalers have organized the job of assembling orders by floors. By providing a small backlog of orders on each floor and by having an elevator man shuttle the partially filled trucks to other floors, standby time of order men on any floor may be minimized.

More typically, a lack of balanced handling occurs from the use of too few pieces of materials-handling equipment. The result in such instances is that men are idle when a hand truck or other equipment is not available for them to load, transport, or unload. For example, at one warehouse it was observed that two men were using one stevedore truck in unloading. While the man in the delivery truck stacked the packages on the hand truck, the second man leaned on the hand truck until it was loaded; when he rolled it out to deposit the load on the receiving platform, the man in the truck was idle until the hand truck was returned for the next load. A more balanced operation could have been obtained if both crew members had used stevedore trucks. (See fig. 4.) In another case, when goods were being received at the same time that orders were being assembled, there were not enough semilive skids for both operations. Merchandise was therefore unloaded by hand truck, stacked on the receiving platform, then hand-loaded on skids (when they were available) for movement into the warehouse. Results from a study of materials-handling equipment needed at different times and at different points in the warehouse could produce a better balance of men and equipment or could show the man-hours to be saved by a few additional pieces.

Establishing Standards of Performance for Order Men

Standards of performance are necessary to obtain optimum effort from a warehouse force. Some reasons why production standards are important may be noted. (1) An announced standard of production gives operators a goal toward which to work. Most workers want to know what is expected of them and are anxious to live up to production requirements. In the absence of standards, order men work at their own estimate of what represents "an honest day's work"; this estimate may or may not be an acceptable standard to management. 9/ (2) The establishment of production standards makes it possible to set production levels at which management can reward or discipline employees. Thus, order men achieving production rates considerably above the average may be given company recognition; order men doing considerably less than the standard rate of performance may be retrained, reassigned, or discharged.

9/ Hoslett, S. D., Ed., Human Factors in Management, Harper Bros., 1951.

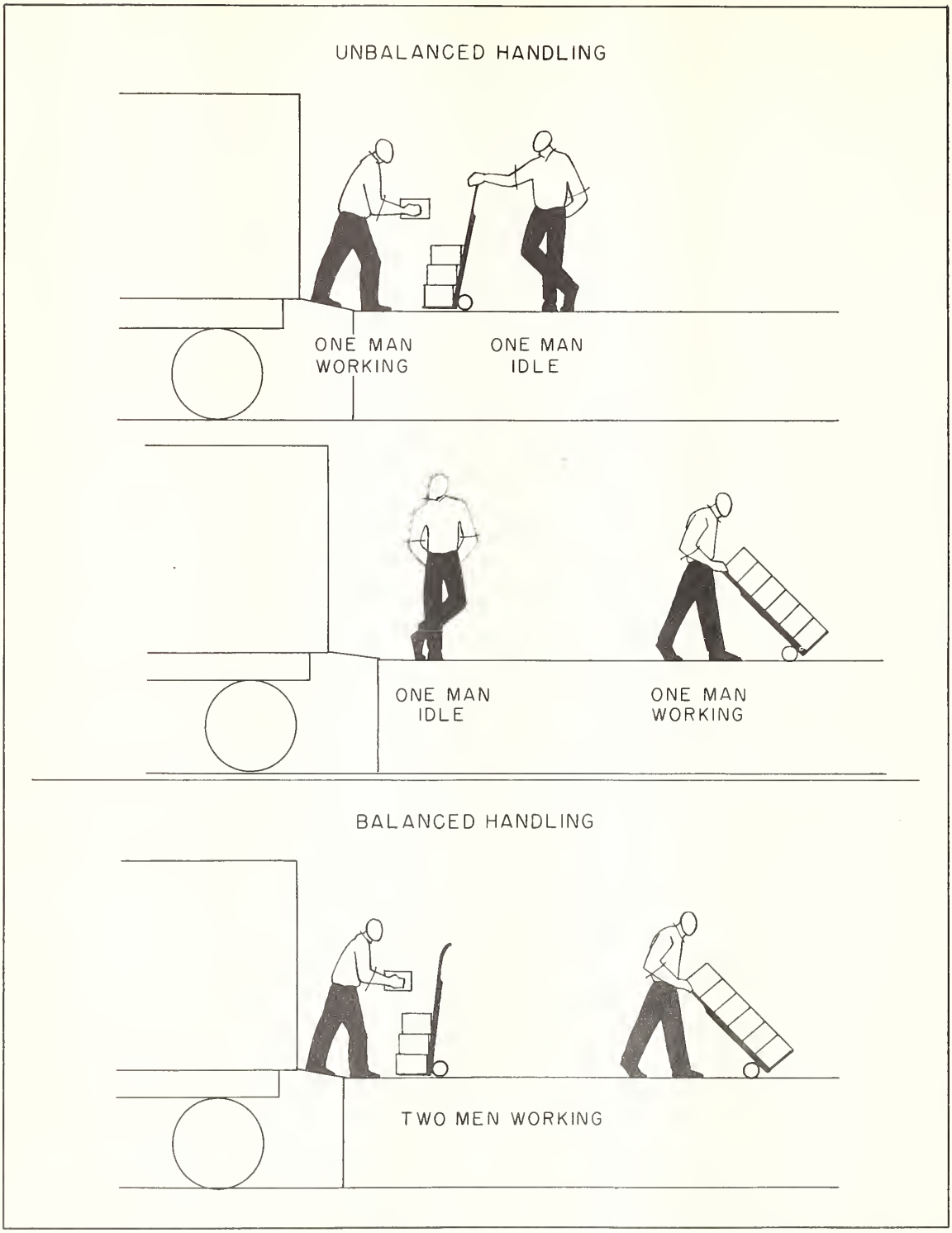

Figure 4.--Two ways of moving merchandise.

To establish standards of performance two steps are necessary: (1) The operation must be standardized insofar as possible; and (2) a way of fairly measuring productivity must be devised. Most wholesalers have standardized the job of order picking. For example, wholesalers give their order men a systematic way of canvassing the warehouse by arranging the stocks, as previously indicated, or by specifically telling the order men the sequence of floors or sections of the warehouse to cover. A systematic way of selecting items is necessary to insure that all order men are doing their job as economically as possible—whatever the particular sales order they are working—and to facilitate measuring productivity.

Some wholesalers attempted to evaluate the productivity of their order men by analyzing the number of orders or tonnage assembled in a fixed amount of time. These attempts are worth while, but the results need to be used with caution. A measure of productivity should take into account as many factors as possible that affect the work. Thus, if productivity is to be estimated by the average number of tons assembled in an 8-hour day, such factors as the number of orders, the average size of orders, and perhaps the number of items should be considered since these factors will affect the tonnage a man is able to assemble. In the Appendix, a method is described for measuring the productivity of truck drivers and a similar method has been outlined for evaluating the performance of order men. The methods described make it possible to take into account a number of factors which affect performance.

Such measures of productivity are one way of spotting relatively inefficient order men. However, studies on productivity can go further and determine why one man's production is high and another man's production is low. For this purpose, close observation of the order assembling procedure is necessary and time and motion studies may be helpful. Only intensive study can uncover inefficiencies in the over-all system of assembling orders and point up practices of individual order men that waste time and make extra work.

Increasing the Efficiency of Truck Loading

Efficiencies in delivery truck loading and unloading have been introduced by several wholesalers. Most of the wholesalers have orders loaded on their trucks in such a manner that the first order to be unloaded is put on the truck last and vice versa. This procedure simplifies unloading since at each stop the order to be unloaded will be immediately at hand. Loading in such a systematic manner also reduces the likelihood of making errors in unloading because cases for each order will be grouped together.

To load orders according to delivery sequence, it is necessary to know the sequence in which stops are made. Several wholesalers have the driver of the truck assist in loading his orders because he knows how the route is covered and, therefore how the orders should be arranged. Other wholesalers have routes laid out for the driver, either by the delivery supervisor or as part of a tabulating system. Under these systems the

truck is loaded and the driver makes his stops in the order in which his delivery tickets are arranged. Systematic loading is facilitated by systematic organization of routes.

When orders fill only a part of the truck (for example, a few orders for special delivery), loading and unloading time can be saved by placing all the goods as near the truck gate as possible. By loading only the rear of the truck, the length of the truck body need not be traversed for each package and often all loading and unloading can be done without going into the truck body. Wholesalers following this practice reported that when properly arranged in the truck, packages do not shift in transit.

Truck loading time may also be reduced by using conveyors. Portable conveyors of different length can be employed in different loading situations. Loading is usually done most efficiently by a 2-man team, one taking the package from the skid and placing it onto the conveyor, the other taking the package from the conveyor and stacking it into the truck. Conveyor loading is particularly worth while where the assembled goods cannot be brought close to the delivery truck. Additional savings may be accomplished by taking the conveyor along and using it in unloading at the retail store.

Further study of operations connected with order assembling and truck loading might reveal more efficient ways of doing these jobs.

SOME WAYS OF HOLDING DOWN DELIVERY COSTS

Delivery costs are, in large part, determined by the kind of service the wholesaler gives his customers. The frequency of deliveries, the size of orders unloaded, and the distance from the warehouse are all contributing factors and all are governed by the needs of the trade. These factors may be said to affect the direct costs or those which vary directly with the orders delivered. In addition to these, there are overhead or indirect costs of delivery such as truck depreciation and maintenance. A working relationship with the retailer which takes cognizance of delivery costs is an important step toward reducing these expenses. At the same time, there are things which the wholesaler himself can do to reduce the overhead costs of delivery. This report describes some of the ways in which wholesalers are working with their customers to reduce direct delivery costs and some of the things they are doing to reduce indirect or overhead costs of delivery.

Some Ways of Reducing Direct Delivery Costs

Direct costs of delivery may be reduced in the following ways: By reducing the number of deliveries; improving truck routes; reducing the time spent in unloading at the retailers' establishments; using common carriers; and by increasing the size of delivered orders.

Reducing the Number of Deliveries

Perhaps the first step in reducing the number of deliveries to individual retailers is to establish a firm delivery schedule. Such a schedule should recognize the needs of the trade serviced, as well as the cost of deliveries. Equally important, the established schedule should be made known to the customers so they can plan their purchases accordingly. Most wholesalers reported that they had regular delivery schedules and these were accepted by their customers.

Although most wholesalers make only one delivery a week to the bulk of their retail customers, some reported making two and even three calls a week. Of course, some customers demand more than one delivery a week, and where the volume purchased is large enough, more than one delivery a week may be desirable as a means of maintaining good will. However it appears likely that the number of such accounts could be reduced by a careful pruning of the list. A periodic review of deliveries made will often show that relatively few customers, many of whom are small, are regularly requesting extra deliveries.

In some cases, the stores getting two or more deliveries a week are small customers close to the warehouse where the cost of delivery appears trivial. However, in the aggregate, these do increase the over-all cost. Often, such retailers can be induced either to wait for supplemental orders until a regularly scheduled delivery is made or to pick up at the warehouse the merchandise they need between regular deliveries.

Late orders and specials are the causes of extra deliveries even among wholesalers who try to maintain firm schedules. Competent salesmen can help to cut down on these special deliveries by encouraging the retailers to carry adequate stocks. Timely advice of this nature is appreciated by the retailer who recognizes that it may help him to avoid losing sales on account of out-of-stock items.

The number of deliveries can also be reduced by increasing the amount of merchandise picked up by retailers through a cash-and-carry or will-call arrangement. Several wholesalers handle late orders which cannot be delivered on the regular schedule by referring customers to their cash-and-carry operation. Properly handled, this has the effect of informing retailers that the expense of delivery on such orders is high and cannot be borne by the wholesaler without increasing the over-all costs of wholesaling.

Convenient arrangements for accommodating cash-and-carry and will-call trade will induce more retailers to pick up their orders. One wholesaler designed a new warehouse with a loading area wide enough to handle customer trucks and autos in off-the-street space. He has also developed a priority system to assure rapid assembling of cash-and-carry and will-call orders. The shipping clerk gives immediate attention to such orders announcing them over a speaker system so that one of the

order men can pick them up almost immediately. Comfortable chairs for customers are provided in the sales show room while their orders are being filled. The wholesaler feels that any expense added by giving cash-and-carry orders priority is more than offset by the increased cash-and-carry volume induced. The conveniences afforded cash-and-carry customers by this wholesaler appear to have paid off since a large proportion of his total volume is done on a cash-and-carry basis.

Several wholesalers have found it profitable to offer discounts for cash-and-carry purchases. While reflecting the savings in nondelivery, these discounts are frequently less than it would cost the wholesaler to make the delivery--particularly on small orders. However, for the small retailer who operates a truck or automobile of his own and who does not figure his time in making pick-ups, cash-and-carry discounts are a mutually advantageous arrangement. It is also one way of highlighting the costs of wholesaling and the retailer's responsibility and opportunity for keeping costs down.

Retailers are more likely to pick up their own orders if the warehouse is located conveniently to them. For wholesalers operating over a large trading area, a single warehouse not only may limit the possibilities of having customers pick up their merchandise but also may greatly increase the cost of justifiable deliveries. Accordingly, some wholesalers have established branch warehouses. One wholesaler derives almost 50 percent of his business from five branch warehouses which he operates in almost the same territory covered by his service salesmen. He reports that many of his service customers patronize the branches on their own volition for small orders and that the operation of these branches saves many delivery miles. He feels that the branches add to his total volume of business and do not materially take away business from the service operation. Of course, the advisability of operating branch warehouses is to be determined by other factors besides delivery costs; this discussion merely points up the value of branches in one respect.

Improving Truck Routing

Arranging truck routes as efficiently as possible is another means of keeping direct delivery costs at a minimum. For most wholesalers, the first step in efficient truck routing is to have sales territories and delivery routes coincide. In this way, each truck route as well as each salesman's itinerary can be designed to keep the number of 6-hour or 13-hour delivery days as few as possible. Since incomplete delivery days may frequently bear the cost of an 8-hour day and excessive hours usually mean overtime pay, a balanced day is likely to give best returns for each delivery dollar.

When the route territory is established, a next step is to determine the best sequence of stops. Aside from the special requests of a few customers who may demand delivery at certain times of the day, routes should be laid out so that there is a minimum mileage and back-tracking between stops. Most wholesalers feel that this task cannot be left to

the drivers, but should be marked out by the delivery supervisor or an executive officer. The job requires a review of individual routes for proper sequence of calls, and to make sure that overlapping routes and long runs to reach individual retailers are at a minimum. Since new customers are constantly being added and some old customers drop out, a periodic review of this kind should be made to insure efficient routing. In addition to this desk review, wholesalers say first-hand information should be obtained by having the route supervisor accompany drivers from time to time--particularly on problem routes.

Reducing Time Spent in Unloading at the Retailers

Unloading at the retailers' establishments accounts for a considerable part of total delivery time. In almost every case the driver must unload the order himself without the assistance of store personnel or convenient facilities for handling goods. Many retailers have clerks or stock boys available but do not have them help to unload because they feel that is part of the wholesaler's service. Other retailers will build or remodel stores without regard for the manner in which goods are to be unloaded. Moreover, the driver must frequently wait until the grocer has time to check the delivery and initial a copy of the invoice.

Several wholesalers reported that getting retailers to cooperate is, in part, a matter of educating them. Where retailers realize that by helping drivers reduce the time spent in unloading, some of the savings in delivery costs will come back to them in lower prices, wholesalers are confident they will cooperate. In part it is also a matter of facilitating their assistance. For example, the use of a portable conveyor permits even older grocers and one-man operators to help with the unloading; this same device lessens the reluctance of some retail clerks to do their share.

Another way of reducing unloading time is to forego delivery receipts. When the retailer is not required to sign an acknowledgment of correct shipment, he is less likely to demand a check of the delivery while the driver waits for his receipt. Some wholesalers recognize that there is little need for delivery receipts. Most wholesalers would honor a customer's claim for short shipment even if he had first acknowledged complete shipment, and retailers would be unlikely to make unfounded claims repeatedly, since the wholesaler would shortly become suspicious.

Wholesalers having a voluntary chain of retailers report they have been successful with many of their retailers in these respects. These wholesalers have emphasized the mutual advantage of cooperative unloading, and by participating in store engineering have given unloading facilities proper consideration. Moreover, where close relations have been established, the need to have the driver wait while the retailer checks the order is obviated, both retailer and wholesaler can feel confident that any differences found in a later check will be fairly reported and corrected.

Unloading time can also be reduced by employing a helper on the truck, but only under certain circumstances is this practice likely to result in a net dollar saving. Helpers can contribute as much to unloading as the regular driver, and two men can often unload in less than half the time it takes one. However, since helpers do not reduce driving time, and indeed, are idle during this time, their usefulness increases with the proportion of route time taken in unloading. Accordingly, they are useful mainly on city routes. In cities, the time it takes to park the truck may also be reduced with a helper's assistance. Moreover, where a route takes several hours of overtime for one man, adding a helper may eliminate the need for overtime and in this way may result in a net saving.

Using Common Carriers

Sometimes the direct cost of deliveries can be reduced by having merchandise hauled by common carrier. Retailers who are located at a distance from the warehouse or off a regularly scheduled route can frequently be given delivery service at lower cost through others means than that of the wholesaler's truck. One wholesaler has developed a chart showing the comparative cost of transporting by common carrier and by his own truck when operating to various locations. Where the common carrier cost is less (and this occurs often when the truck cannot be loaded to near capacity for the trip), the common carrier is used. This wholesaler, servicing a large trade territory, reports that he saves many delivery dollars in this way.

Increasing the Size of Orders

As previously indicated, the size of an order directly affects the cost of each wholesaling operation connected with it. The cost of taking the order, processing it through the warehouse, and delivering it to the retailer will each be proportionately less if the order is larger. The size of an order is determined at the time the order is taken, and, accordingly, some ways of increasing the size of orders were discussed earlier. 10/ One additional comment should be made here. To the extent that special deliveries can be avoided and the orders involved can be delivered with the orders going out on regular schedule, the size of each delivered order may be somewhat larger.

Some Ways of Reducing Indirect Costs of Delivery

For many wholesalers the indirect costs of deliveries is a major part of the total delivery cost. Indirect costs may be said to include

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10/ Because the size of an order has such a direct bearing on the costs of processing and delivering it, there is need for a close examination of the problem of order size and profit. Research could profitably be done on means of determining minimum order size under various conditions and for different kinds of wholesale operations, as well as on means of increasing order size.

the following: The time that trucks are idle either on a standby basis or while in repair; and the cost of accidents, maintenance, and depreciation.

Reducing Costs of Maintenance and Depreciation

Many of the indirect costs of delivery could be reduced by an effective program of preventive maintenance. Such a program can reduce indirect costs on deliveries in at least four ways: (1) By minimizing the frequency and severity of truck breakdowns which in turn, would mean lower repair costs. (2) This could result in fewer days in which trucks are tied up in repair and therefore could mean fewer standby trucks. (3) Reducing depreciation which is translated into dollars and cents when a truck has completed its planned years of service. (4) Reducing the number and cost of accidents arising from faulty equipment.

A good preventive maintenance program should include at least the following: (1) A careful selection of truck engine and capacity in terms of route and load requirements. (2) A systematic procedure for checking truck use and wear. (3) Adequate records covering truck operations and maintenance. (4) Careful driver selection and training, and continuous supervision. (5) Management support and cooperation. 11/ It should be recognized, however, that since there are many different kinds of delivery operations and truck fleets, a preventive maintenance program must be developed to suit the wholesaler's individual needs.

Although the study on which this report is based did not cover the relative advantages of different makes and types of trucks, some elementary observations on the importance of proper selection are in order. For example, trucks that operate in congested city streets should have good maneuverability and pickup but need not have the power for long hauls at high speed nor the load capacity of trucks which cover rural outlying routes. A truck which covers a mountainous route may need an engine specially built for such terrain. Overlooking such obvious considerations may mean excessive fuel consumption and undue engine and body wear.

Perhaps the core of a preventive maintenance program is the systematic inspection of trucks and the immediate attention to repairs and adjustments that may be uncovered. One wholesaler reported that he had daily check sheets kept by the chief mechanic showing that each unit was checked for gas, oil, tire wear, tire pressure, batteries, and so forth necessary for proper care of rolling stock. Another wholesaler reported that when trucks are returned to the lot at night they are checked by mechanics for such things as tire pressure, uneven tire wear, body damage,

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11/ For another statement on preventive maintenance musts, see "Reducing Truck Maintenance Costs," by Van Salley Wholesale Grocer News, June 1951.

and batteries. The drivers are questioned briefly on any mechanical difficulties they may have experienced during the day's run, and trucks are taken off duty as soon as mechanical deficiencies are found. Trucks are regularly taken off duty by this wholesaler at the end of each 1,000-mile run for a complete check-up and for routine adjustments or repairs. (See Fig. 5 for examples of record forms.)

Records of truck operation and maintenance are necessary in order to evaluate truck performance and costs. Only by maintaining such records can the supervisor keep informed on the operation, measure the effectiveness of his program, and render reports to management. Data for operation records may be collected from driver logs or from mechanical devices installed in trucks (such as tachometers). Data on maintenance, of course, may be obtained from truck servicing and repair personnel. It is important, however, that such data be obtained for each truck and also summarized in some form which will make it possible to see the operation as a whole and which will permit comparisons between individual trucks, between different periods of the year, and before and after the introduction of certain programs.

Several wholesalers reported extensive driver selection and training programs. 12/ In most cases, these programs included a thorough physical examination, a period of apprenticeship in the warehouse to learn company products and policies, training by a special instructor on how to operate a truck, and a period of service as a driver helper and special detail man. Usually, driver training includes learning about truck mechanics so that forewarning of truck trouble can be recognized and reported by the driver, and minor road adjustments or repairs can be made without calling for road service. Wholesalers reported that it is necessary to follow up training programs with periodic road checks to see that drivers are following approved practices and have not acquired bad driving habits.

Supervisors of truck fleets report that a preventive maintenance program stands or falls on the basis of support given it by top management. Where company officers do not give proper consideration to the kind of truck sent on particular routes, or if trucks are sent out on routes when they have been earmarked for repairs, there will be needless wear and high maintenance costs even under a well-planned maintenance program. Similarly, if company policies are in part responsible for high driver turnover, or inadequate time is allowed for driver selection and training, an efficient truck operation is less likely to be achieved. On the other hand, when top management takes a personal interest in and cooperates with the program, drivers feel it is really important and make greater effort to follow it.

12/ At the 1951 U. S. Wholesale Grocers' Association convention, Harvey Ragland, Jr., reported on a comprehensive driver training and selection program followed in his company.

U.S. WHOLESALE GROCER

TRUCK OPERATING RECORD

TRUCK NO. _____ YEAR AND MAKE _____ MONTH _____

DATE	MILEAGE	GAS	OIL	GREASE	PERIODIC CHECK-UP	DATE	DATE	DATE
1					Road Test			
2					Tire Condition			
3					Spare Tire			
4					Tools - Jacks and Chain			
5					Generator			
6					Fan Belt			
7					Anti-Freeze			
8					Battery Cable			
9					Horn			
10					Windshield Wiper			
11					Headlights			
12					Tail Lights			
13					Body Lights			
14					Steering			
15					Clutch			
16					Foot Brakes			
17					Emergency Brake			
18					Body Work			
19					Windows			
20					Rear View Mirror			
21					All Gauges			
22					Radiator			
23					Wheel Lugs Checked			
24					Wheel Alignment			
25					Repack Wheel Bearings			
26					Overhaul Engine			
27					New Tire Installation			
28								
29								
30								
31					Air In Tires			
TOTALS					MECHANICS SIGNATURE			
REMARKS					REMARKS			

Figure 5.--Example of truck operating record form.

One of the problems faced by wholesalers in connection with truck maintenance is whether to have the work done in a shop of their own or to contract it out. Although there is no answer to suit all wholesalers, certain observations made by the wholesalers visited may be helpful. Where a large fleet of trucks is operated and the close attention of a top official is both warranted and possible, the wholesalers feel that they can do the maintenance work more efficiently themselves. In such cases only major repair jobs are sent out. One rough guide is to consider how many trucks, on the average, make an adequate work load for one or more mechanics. For example, if one mechanic can handle 10 trucks and two mechanics will work at capacity servicing 20 to 22 trucks, the hiring of one man for much less than 10 trucks or two men for considerably less than 20 trucks would likely mean increased maintenance costs. In general, a wholesaler will probably save money and trouble by contracting the work out if he operates only a few trucks and can locate a responsible garage with competent mechanics. However, even in the latter case, the kind of periodic check-up wanted may well be specified by the wholesaler on the basis of recommendations by the truck manufacturer.

Reducing the Number of Accidents

Although preventive maintenance programs can help to reduce the number of accidents owing to faulty equipment, some wholesalers have gone further and developed programs specifically designed to cut accidents. Safe driving programs appear to have been effective where followed. One wholesaler reported cutting the number of accidents in half during the first year of his program and he has obtained several reductions in insurance rates. This wholesaler has a well integrated program which includes careful selection of drivers, intensive training and apprenticeship, accident analysis, safe driver incentives, and a preventive maintenance program for all trucks. In another case, a safety program includes company safety courts in which drivers are jurors and render decisions on any accident in which one of their number is involved. This practice proves educational not only for the driver who has been in the accident but for the others who hear his case. 13/

Reducing the Number of Standby Trucks

As indicated, the cost of maintaining standby trucks is an important factor in indirect costs of delivery. The number of standby trucks reported by most wholesalers is about one out of every 10 trucks in operation. However, some wholesalers reported a considerably higher proportion of their trucks held on a standby basis. One wholesaler, for example, reported holding 4 out of 16 trucks in reserve, a ratio of 1 to 4. Standby trucks are necessary, of course, to fill in when one of the regular

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13/ Harry E. Martin "Maintaining Truck Safety," Chain Store Age, Sept. 1951.

trucks breaks down and while it is being repaired. They are also necessary on those occasions when a special order must be delivered. A preventive maintenance program may reduce the number of standby trucks in a fleet by reducing the number and severity of breakdowns among trucks on regular runs. Some wholesalers have also found that the leasing of trucks as needed can further reduce the number of standby trucks. One small wholesaler owns two trucks, leases a third continually and leases a fourth truck and driver on a day-to-day basis whenever he needs them. He has no standby trucks and reported that the leasing of extra trucks has proved a good way of keeping his delivery costs low.

Some wholesalers lease all their trucks. The cost of carrying standby trucks can be virtually eliminated in this way since most leasing firms will furnish extra trucks as needed and in any event, are responsible for maintaining the full fleet in working order. Other advantages claimed for this practice are: (1) It releases or saves capital for other wholesaling operations; (2) it releases or saves management time and concern since many leasing arrangements include truck selection and maintenance; (3) it sometimes costs no more and may cost the wholesaler less money since many leasing firms have the facilities and experience to keep truck operating costs at a minimum. (The efficiencies thus introduced are reputed to cover their margin of profit.) 14/ These advantages appear especially applicable for the smaller wholesaler who must spread his available capital and managerial staff thinly to cover all essential wholesale functions.

Increasing Pay Loads

Another means of reducing the indirect costs of deliveries is by utilizing trucks more nearly to capacity. Optimum truck utilization is obtained by full loads and by full returns from each truck mile. Many wholesalers make an effort to load their trucks to approximately 90 percent of capacity at the warehouse. This figure is apparently as close to capacity as can be expected in most loadings. One wholesaler has the practice of transferring an order from one truck to another in an adjoining route where this practice helps to give both trucks more complete loads and avoids extra deliveries. Special deliveries in which only a fraction of the truck's capacity is utilized eat into any average loading level which wholesalers seek to maintain. The high cost of making short hauls and delivering single orders can hardly be overemphasized. The previous discussion on ways to decrease special deliveries would be applicable here.

Some wholesalers who operate branch warehouses make deliveries to the branches as part of their customer delivery schedule, and thus can maintain a near capacity load on each run. These wholesalers reported that this practice helped to reduce the over-all costs charged to customer deliveries.

14/ M. D. Dunlap "Truck leasing a—war time discovery," Wholesale Grocer News Oct. 1946.

Trucks can be more fully utilized if they carry merchandise to the warehouse on their return from route deliveries. One wholesaler does this by having his trucks carry merchandise from railroad sidings to the warehouse since the building is not located on a railroad spur. Another wholesaler has his trucks pick up merchandise from suppliers who are located in the territory of some retail customers. Still another wholesaler has his trucks pick up merchandise not otherwise available in less-than-carload lots from suppliers. These wholesalers are thus utilizing their trucks more nearly to capacity during all running hours.

Exercising Effective Control over the Delivery Operation

Although careful driver selection and training are essential parts of any program to hold delivery costs to a minimum, wholesalers recognize that these alone do not assure an efficient delivery operation. Almost every wholesaler uses some method of keeping tab on his drivers' performance as a basis for delivery control and for improving delivery operations.

Methods of Obtaining Data on the Driver's Work Day

Two basic methods of collecting information on how the driver spends his day are the driver log and the mechanical recorder of the truck's movement. Driver logs are of various kinds but all depend on the driver to "chronolog" the day's deliveries. Usually the only information called for is that required by the Interstate Commerce Commission in connection with interstate motor carriers. This is merely a report of the time at which each stop is made and the time at which unloading is completed and driving resumed. Time is usually given to the nearest quarter hour. Thus, the driver reports the time spent in driving and in making the delivery stops.

Driver logs are inadequate either to control effectively the delivery operation or to evaluate driver performance. The data are of dubious accuracy since many drivers prepare their log after the day's run and estimate the time intervals involved. Fleet supervisors place little reliance on the driver logs because, they report, if any stops were made unnecessarily, the time would probably be prorated over the other stops and would not be recorded. Moreover, the data are not in a form that permits ready estimates of productivity since only one factor is covered, namely, the time of driving and of unloading. There is no direct way of relating such data with other factors such as kind of traffic and size of orders which affect delivery performance.

Mechanical recorders of truck movement are of several makes and models but all obtain similar data. (See fig. 6.) All record the time when the truck is in motion and when it is idle. Some recorders also obtain the speed at which the truck is driven. The mechanical unit is usually placed under the dashboard or the glove compartment of the truck, and the record it makes cannot be tampered with by the driver. The data are reported on a form which, together with a listing of stores serviced on the particular

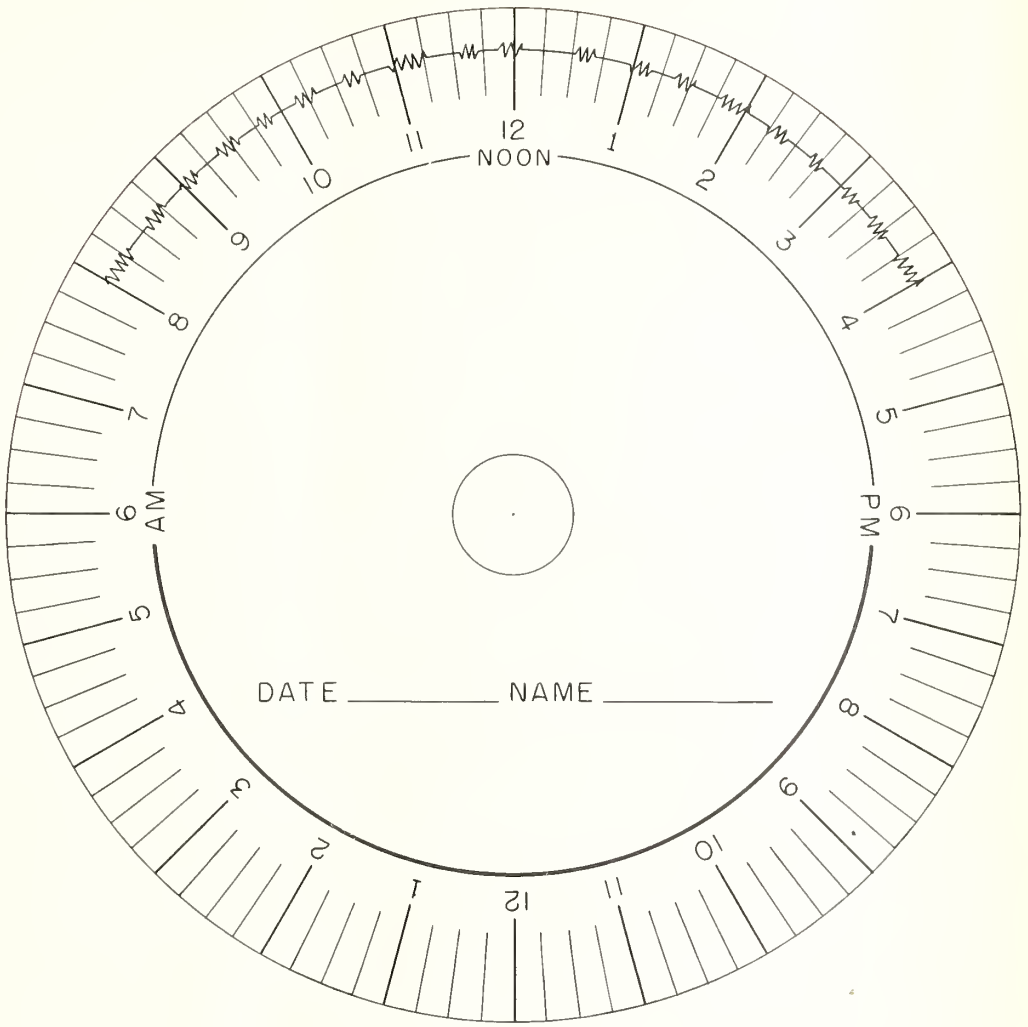

Figure 6.--Example of record obtained from mechanical recorder.

route give an accurate description of the day's run. Because they are more accurate in obtaining certain facts, mechanical recorders are more useful than driver logs in controlling delivery operations.

Mechanical recorders obtain accurate data with which the delivery operation may be reviewed, but they do not furnish direct measures of how efficient and industrious one driver is as compared with another, or whether a driver shows improvement over time. Moreover, they cannot be used to compare the efficiency of one wholesaler's delivery operation with those of another wholesaler. To accomplish these purposes some standard unit of measure is needed. Such units of measure should reflect greater effort and effectiveness of the driver. That is, when a driver works harder or becomes more efficient, the score he earns should show similar gains. To evaluate the efficiency of the over-all delivery operation, the measure should perform the same function for all the drivers that it does for the individual driver.

Methods of Measuring Efficiency of the Delivery Operation

Some wholesalers have established units of measure to evaluate the efficiency of their delivery operations. Sometimes, these are ratios such as cost per ton-mile, or tons delivered per man-hour. Such ratios permit direct comparisons between drivers and companies. However, differences in the ratios obtained by different drivers do not necessarily reflect differences in driver productivity or company efficiency. For example, drivers delivering a few large orders in a few city blocks would receive high ratings on tons delivered per man-hour, with very little effort whereas drivers delivering many small orders on long rural routes would show up poorly. A rating based on cost per ton-mile takes into account mileage as well as tonnage, but the problem is how much should each ton and each mile count in determining drivers' productivity or company efficiency.

The usual justification for using ratios such as cost per ton-mile in evaluating delivery operations without determining what is the proper value for tons and for miles is that, over a long period of time, differences between drivers even out. However, delivery practices do not seem to warrant this conclusion. Drivers usually cover the same route or group of routes again and again. Differences in territory and accounts serviced by different wholesalers make comparison between companies difficult. Accordingly, cost per ton-mile properly can be used in comparing the performance of groups of drivers covering similar routes--and then only if the method of calculating ton-miles is identical.

Some wholesalers take cost of delivery as a percentage of sales as the basis for comparisons. This ratio has the advantage of being easily computed and readily understood. However, it is overly simple as a basis for comparing the efficiency of one delivery operation with another since it too fails to take into account differences in trade and territory serviced by different firms.

A measure is needed which does take into account the differences of trade and territory served and makes comparison possible on the basis of relative efficiency and effectiveness of the delivery operation. One procedure for doing this is outlined in the Appendix. The method given takes into account differences in value of goods delivered, number of miles covered, number of deliveries made and whether routes are in city or noncity territory.

Establishing Standards of Performance for Delivery Truck Drivers

The value of establishing standards of production for plant operations is recognized by industrial engineers. The importance of standards for warehouse order men also was noted. Performance standards for delivery truck drivers similarly give management means of rewarding good workers and rebuking those who do poor work. They also serve as a guide to drivers on what is considered a fair day's work. Performance standards are probably more important for drivers than for factory or warehouse workers since direct supervision is not possible and in its absence some means are needed for encouraging the best performance possible.

Perhaps the principal problem in establishing standards is to measure productivity in a way which the drivers recognize as fair and equitable. As indicated, ratios such as tons handled per man-hour or cost per ton-mile are not accurate measures of a man's performance. The procedure for measuring driver productivity, described in the Appendix, meets most of the objections raised for such measures as cost per ton-mile or tonnage delivered per man-hour. The procedure outlined takes into account tonnage and mileage and in addition, recognizes two other factors affecting delivery: (1) That delivery miles in city traffic take more time than those on noncity routes; and (2) that tonnage divided into many small orders takes more time to unload than the same tonnage requiring fewer stops.

In this method a "normal" time for covering a given route is computed, and actual time taken by the driver can then be compared with the standard. Information to develop the tables for estimating normal time is not dependent on driver logs or mechanical recorders of truck movement. However, the following information is required: Number of stops made on the route; number of hours taken; value of orders delivered; and number of miles covered on the route.

Tables for reckoning "standard" performance are computed in this procedure from records of actual delivery operations and therefore will represent realistic goals for drivers. Since each of the principal factors affecting the time it takes to cover a route are given their proper weight, the procedure is equally applicable to different kinds of routes. Accordingly, a fleet supervisor may compare the productivity of drivers on different routes and also compare the performance of individual drivers over a period of time--even if they are assigned to various routes.

With the assistance of this productivity measure, he may also evaluate the effectiveness of programs introduced to increase driver productivity.

* * * * *

In the preceding pages some of the practices which are followed by leading grocery wholesalers in handling and delivering orders have been summarized briefly. It is felt that many wholesalers will be able to profit by adopting the practices that were observed in some of the wholesale establishments. In the course of making these observations and discussing certain problems with wholesalers, it was found that there are a number of problems that they think need to be solved, and improved methods of performing various operations were recognized to be needed, among which are: (1) Procedures to facilitate direct placement of orders by the retailer; (2) incentives for salesmen and retailers to increase size of orders; (3) methods of doing the paper work connected with processing orders; and (4) means of assembling orders, loading trucks, and unloading at retail stores. In order to find the best solution to these problems or to find better operating practices than were observed, a careful study of the particular phase of operation involved would have to be made. It is contemplated that, in cooperation with the trade, detailed studies will be undertaken to improve some of these practices. Thus ways may be found of holding down the costs of distributing food through this phase of the marketing channel.

APPENDIX

Procedure for Estimating the Productivity of Delivery Truck Drivers

The procedure outlined herein aims to measure the productivity of truck drivers in terms of their industry and efficiency. This method was developed by the Marketing and Facilities Research Branch, Production and Marketing Administration, at the request of several wholesale grocers and is now in use by two firms. It should be noted that the same approach could be used to evaluate the productivity of order men, and perhaps other groups of employees. Moreover, this procedure may be used to compare the efficiency of delivery operations between different companies or branches of the same company, as well as to rate individual workers.

A resume of steps taken in developing this procedure will help in understanding how it works for drivers, and will indicate how this approach may be used by individual wholesalers. First step, detailed data on truck operations were obtained from several wholesalers. Included was the following information about each driver's daily route: Number of stops made; number of hours taken; value and tonnage of orders delivered; number of miles covered; and whether it was a city or noncity route. Second step, on the basis of these data (and delivery practices among grocery wholesalers) a "norm" or standard of performance for a unit of work was designated as the basis upon which actual productivity might be measured. The unit of work selected was the time taken to cover a given route. Third step, the relationship between time on the route and each of the factors affecting it was computed by the statistical device of multiple correlations from the records on truck operations. The most important factors were thus determined, as follows: The number of stops on the route; the dollar value of the orders; and the distance traveled to make the deliveries. City and noncity miles were found to affect the measure of productivity in such a way as to suggest separate treatment. Fourth step, on the basis of the relationship between each of the three variables mentioned under step 3 and the time taken to cover the route, tables were drawn up from which standard performance may be computed for a route with a given number of stops and miles and a given load. Comparisons may then be made between the time actually taken to cover the route and the statistical estimate of the normal time that should have been taken. Separate tables were developed for city and noncity routes.

The tables were developed from the estimating equations which were computed to describe the relationship between time on the routes and the three variables, number of stops, dollar value, and distance traveled. A linear relationship was assumed to exist between the variables, and, accordingly, for each additional stop and for each added unit of dollar value and distance traveled, a fixed unit of time was added. The tables on the following pages show the amount of time to be added for routes of a given number of stops, dollar value and miles traveled. These tables

Table for Estimating Normal Time for Covering Routes
(Noncity routes only)

Number of stops		Distance covered		Value of orders	
Number	Hours and Minutes	Miles	Hours and Minutes	Dollars	Hours and Minutes
		50-59	1:05		
6	0:57	60-69	1:18	600-699	0:37
7	1:05	70-79	1:31	700-799	0:44
8	1:13	80-89	1:45	800-899	0:50
9	1:21	90-99	1:59	900-999	0:57
10	1:29	100-109	2:12	1000-1099	1:03
11	1:37	110-119	2:24	1100-1199	1:09
12	1:45	120-129	2:37	1200-1299	1:15
13	1:54	130-139	2:51	1300-1399	1:21
14	2:02	140-149	3:03	1400-1499	1:27
15	2:10	150-159	3:17	1500-1599	1:33
16	2:18	160-169	3:30	1600-1699	1:39
17	2:26	170-179	3:43	1700-1799	1:46
18	2:34	180-189	3:57	1800-1899	1:52
19	2:42	190-199	4:09	1900-1999	1:58
20	2:51	200-209	4:22	2000-2099	2:05
21	2:59	210-219	4:36	2100-2199	2:12
22	3:07	220-229	4:49	2200-2299	2:18
23	3:15	230-239	5:03	2300-2399	2:24
24	3:24	240-249	5:15	2400-2499	2:30
25	3:31			2500-2599	2:36
26	3:39			2600-2699	2:42
27	3:48			2700-2799	2:48
28	3:56			2800-2899	2:54
29	4:04			2900-2999	3:01

Constant time to be added is 3:02

Example 1. Driver A makes 17 stops, travels 162 miles and delivers $2,310 of groceries. Add 2:26 plus 3:30 (interval 160-169), plus 2:24 (interval 2300-2399); this comes to 7 hours and 80 minutes or 8:20. Add the constant 3:02 for a total of 11:22. Driver A should normally have covered the route in about 11 hours, 20 minutes.

Example 2. Driver B makes 19 stops, travels 152 miles and delivers $1,809 of groceries. Add 2:42 plus 3:17 plus 1:52; this comes to 6 hours and 111 minutes or 7:51. Then add the constant factor of 3:02 for a total of 10:53. Driver B should normally have covered the route in about 11 hours.

Table for Estimating Normal Time for Covering Routes
(City Routes Only)

Number of stops		Distance covered		Value of orders	
Number	Hours and Minutes	Miles	Hours and Minutes	Dollars	Hours and Minutes
5	0:48	5-9	0:03	500-599	0:39
6	0:57	10-14	0:06	600-699	0:47
7	1:06	15-19	0:09	700-799	0:55
8	1:16	20-24	0:12	800-899	1:03
9	1:26	25-29	0:15	900-999	1:11
10	1:36	30-34	0:18	1000-1099	1:19
11	1:45	35-39	0:21	1100-1199	1:27
12	1:54	40-44	0:24	1200-1299	1:35
13	2:04	45-49	0:27	1300-1399	1:43
14	2:14	50-54	0:30	1400-1499	1:51
15	2:24	55-59	0:33	1500-1599	1:59
16	2:33	60-64	0:36	1600-1699	2:07
17	2:42	65-69	0:39	1700-1799	2:15
18	2:52	70-74	0:42	1800-1899	2:23
19	3:02	75-79	0:45	1900-1999	2:31
20	3:11			2000-2099	2:39
21	3:20			2100-2199	2:47
22	3:30			2200-2299	2:55
23	3:40			2300-2399	3:03
24	3:49			2400-2499	3:11
25	3:58			2500-2599	3:19
26	4:08			2600-2699	3:27
27	4:18			2700-2799	3:35
28	4:28			2800-2899	3:43
29	4:37			2900-2999	3:51
30	4:46			3000-3099	3:59
31	4:54				
32	5:03				
33	5:12				
34	5:21				
35	5:30				

Constant time to be added is 3:04

Example 1. Driver A makes 22 stops, travels 57 miles, and delivers $1,950 of groceries. Add 3:30, 0:33, and 2:31. This is 5 hours and 94 minutes or 6:34. Then add the constant of 3:04 for a total of 9:38. Driver A Should normally cover the route in about 9-1/2 hours.

Example 2. Driver B makes 17 stops, travels 39 miles, and delivers $2,210 of groceries. Add 2:42, 0:21, and 2:55. This is 4 hours and 118 minutes or 5:58. Then add the constant of 3:04 for a total of 8 hours and 62 minutes or 9:02. Driver B should normally cover the route in about 9 hours.

are based on records of one wholesaler and are given as examples rather than for general application. (The Marketing and Facilities Research Branch, PMA, USDA, will be glad to assist wholesalers to develop tables for their individual operations.) The sum of the time units, together with the constant unit of time (which in the estimating equation is "a", the time element common to all drivers that is unexplained by differences in the factors studied) gives the total time that a given route should take, on an average.

Actual time taken on the route is compared with the normal time computed from the tables. In this example, differences of less than $1\frac{1}{4}$ hours may be due to factors which are not taken into account by this procedure. However, when actual time is frequently more than $1\frac{1}{4}$ hours above normal time, and whenever actual time is more than $2\frac{1}{2}$ hours above normal time, an explanation should be required. For very long routes or those with especially heavy loads or a very large number of stops, differences somewhat greater than the above may be anticipated.

Of course, the factors included in the table do not account for all the difference in driver performance. Other factors, such as type of truck, number of items on the truck, traffic detours, weather, and so forth, affect route time. However, these variables are of lesser importance, although management may take them into account when explanations of low productivity are required.

Standards of performance developed by this procedure are based on past performance of the drivers so that they represent realistic goals. However, since they are based on past performance, a periodic review is necessary to see whether they need to be raised or lowered to meet current performance possibilities.

Normal time is computed as follows (using the table for noncity routes in this example): Find the number of stops in the table which corresponds to the number of stops (deliveries) actually made on the route. Opposite the number of stops is a figure denoting the hours and minutes to be added together for computing normal time on routes of this number of stops. For example, if driver J. R. makes 17 stops, the time to be added is 2:26 (2 hours and 26 minutes). Similarly, the hour and minute figures representing mileage and value of the orders are taken from their respective columns by finding the interval which most nearly approximates the mileage and the value of the orders actually delivered. For example, if on this route, driver J. R. traveled 171 miles, the time is taken from the column for distance covered opposite 170-179; that is, 3:43. If driver J. R. delivered $2,740 of groceries, the hour figure is taken from the column for value of orders opposite 2700-2799; that is, 2:48. These hour and minute figures are added together to represent the time explained by the three factors (stops, distance, and value of orders). In this example, the time would be 7 hours and 117 minutes or 8:57. We then add a constant of 3:02 hours to represent factors other than the three mentioned which affect the time it will take to cover a given route. Accordingly, driver J. R. should normally have taken 11:59 or about 12 hours

to cover the route. Additional examples of how normal time is computed are given at the bottom of the tables.

Evaluating the Over-all Delivery Operation

After developing tables for estimating normal delivery time, a wholesaler may evaluate the efficiency of his over-all delivery operation from time to time. This would be accomplished by comparing the average route time for a given period with the standard time computed from the tables for a route similar to the average route run during the given period. Similarly, the relative efficiency of delivery operations for two periods of time could be determined by comparing both with the standard time. Comparisons between delivery operations for a given period and the standard are made as follows:

1. Compute an average city and an average noncity route for the period to be compared; for example, a week, a month, or a quarter. This is obtained by totaling the number of miles traveled, the dollar value of goods delivered, and the number of stops made by all drivers during the given period. Divide each of these totals by the number of routes run, during the period, by all drivers.

2. Similarly, compute the average time it took to cover the city and noncity routes used to compute the average routes in (1). That is, the total number of hours on city and on noncity routes by all drivers is divided by the number of city and noncity routes that were run during the given period.

3. Compare this average time with the standard time reckoned from the wholesaler's tables for routes of the same number of miles, stops, and dollar amounts as the average computed for all city and all noncity routes.

4. If the average delivery time in the given period is more than 1-1/4 hours greater than the standard time, (for the example previously cited) the wholesaler can feel that the difference is probably significant. If the difference favors the more recent period, he can assume that it reflects increased efficiency.

Note: Comparisons between delivery operations of different wholesalers could be made in the same way if tables applying to wholesalers generally were available for estimating normal time. Such tables could be developed by obtaining records from additional wholesalers.

Evaluating the Productivity of Order Men

As previously indicated, the procedure used to evaluate productivity of delivery truck drivers may also be used to develop a measure of productivity for order men. The steps involved are similar:

1. From on-the-job observations, a unit of work is designated as the basis upon which productivity might be measured. For order men, the most appropriate unit of work is probably tons or dollar value of goods assembled in an 8-hour day.

2. The various factors which might affect the quantity of merchandise assembled are determined. In assembling orders these factors are probably the number of orders involved (that is, trips through the warehouse) and the number of items (that is, separate item selections).

3. Daily records are kept for a period of 4 to 5 weeks, or more, of each order man's daily performance: The tonnage or value of goods assembled; the number of orders; and number of items included. From these records, a multiple correlation estimating equation is computed, on the basis of which a table for determining "norms" or standard performance is developed. Separate tables would be developed for single and multiple-story warehouses.

4. Comparisons are made between actual tonnage or dollar value of goods assembled (with a given number of orders and items) and the standards for such a day's work. Again differences of a certain amount between actual and standard performance may be anticipated but performances considerably or consistently poorer than the standard would indicate the need for some explanation.

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